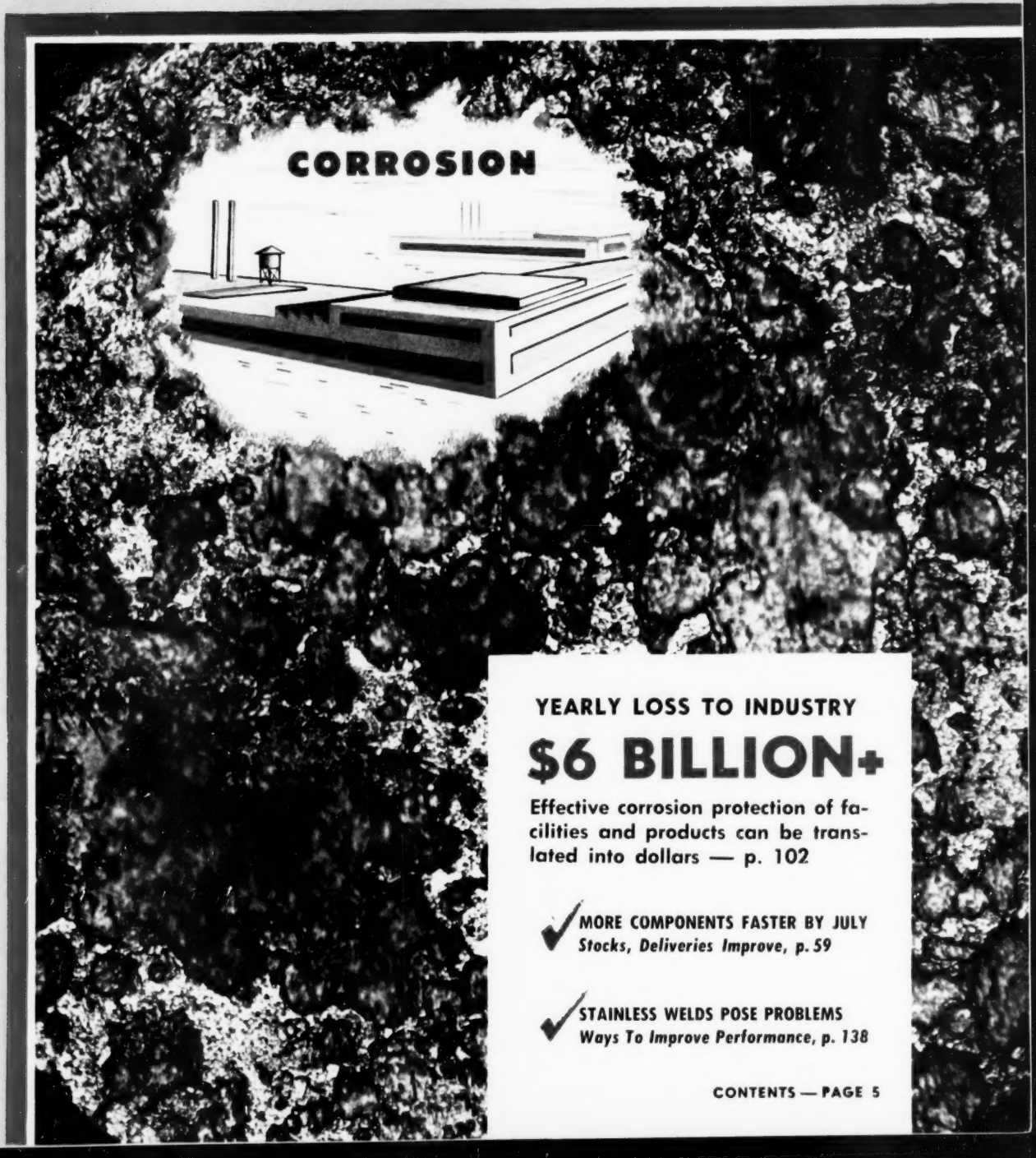
APRIL 6, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



YEARLY LOSS TO INDUSTRY

$6 BILLION+

Effective corrosion protection of facilities and products can be translated into dollars — p. 102

✓ MORE COMPONENTS FASTER BY JULY
Stocks, Deliveries Improve, p. 59

✓ STAINLESS WELDS POSE PROBLEMS
Ways To Improve Performance, p. 138

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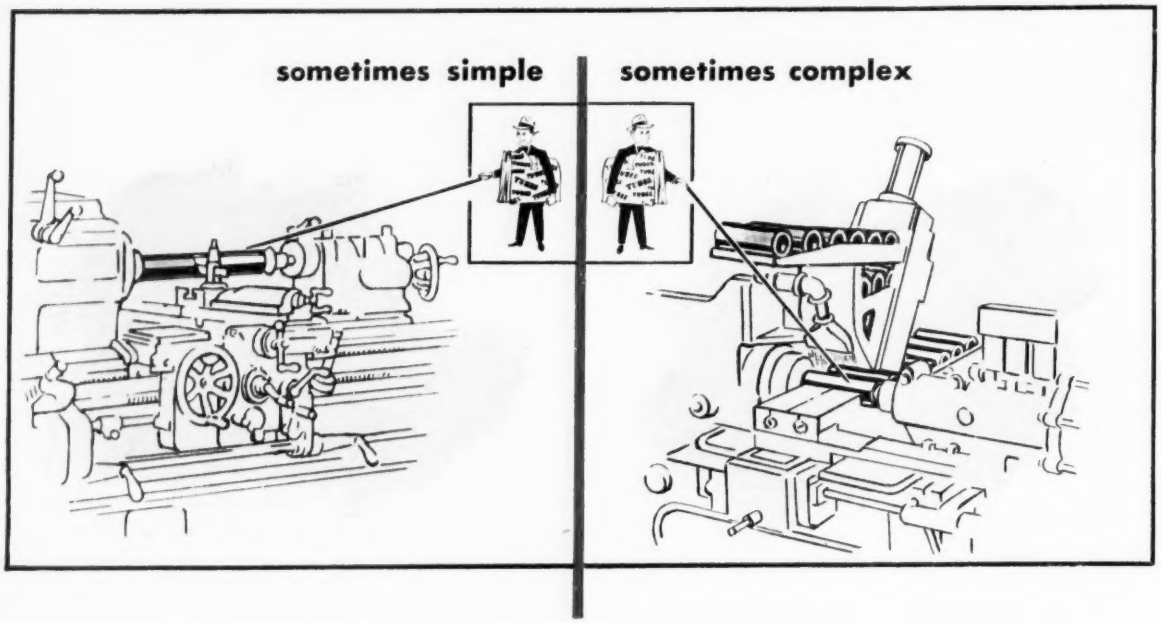
Machinability of Tubing



requiring . . .

Much can be said about the comparative machinability of these three types of seamless mechanical tubing. What is best for one user is not always best for another user. For example —B&W is supplying mechanical tubing to three different manufacturers who are producing the same piece of equipment — one from Hot-Finished tubing, the second from Cold-Drawn tubing, and the third from Roto-Rocked tubing. The real criterion for machinability rests with the user and how he is equipped to produce the part.

In determining the type to be used in a specific application attention should also be given to the differences in surface finish, tolerances, and original cost which exist between hot-finished and cold-finished tubing and how these factors affect final production costs.

Mr. Tubes—your nearby B&W Tubing Representative — is a good man to consult when you want to match tubing types to your plant facilities and specific jobs . . . to keep production up and costs down. You'll find B&W Bulletin TB-340, "A Guide to the Use of Seamless Mechanical Tubing", helpful, too. Write for it.

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

B&W SEAMLESS and WELDED TUBES

TA-1718(M)

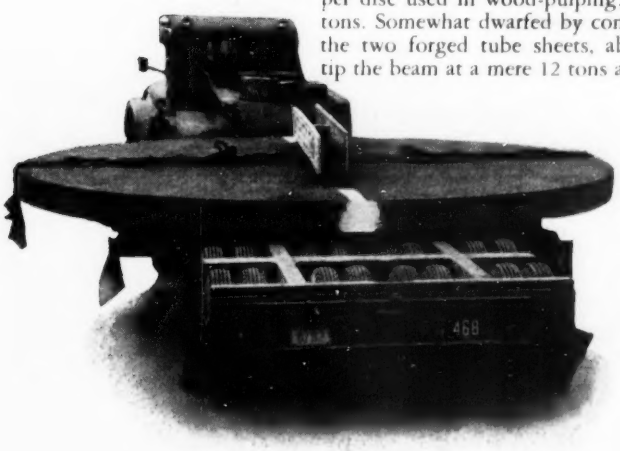
Not to be confused with Flying Saucers

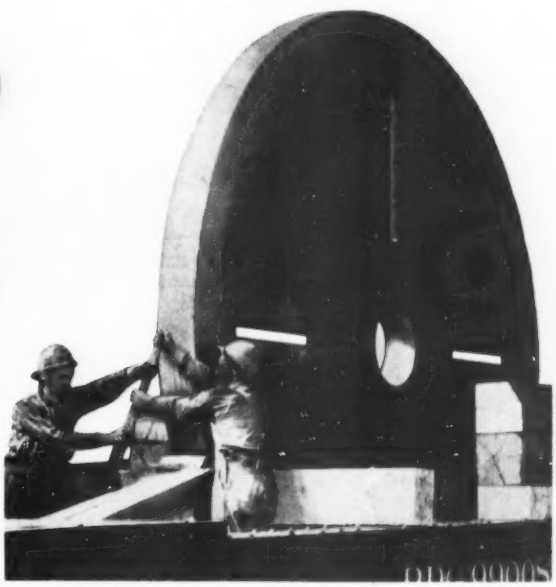
Here are some Bethlehem forgings with three things in common: they are very large, very flat, and very round. From that point on, if you consider their uses, they are not even distant cousins.

That whopper on the truck weighs 48 tons. It is one of eleven discs for a big compressor to be installed in a wind tunnel. The slotted forging standing in the freight car is a chipper disc used in wood-pulping; weight, 35 tons. Somewhat dwarfed by comparison are the two forged tube sheets, above, which tip the beam at a mere 12 tons apiece.

You might think from this that we're especially partial to circular pieces. Actually, we like to get our teeth into almost every kind of forging, regardless of shape or size. At times there are orders that call for some pretty ingenious ways and means, and these our shops are equipped to handle as capably as the simpler types.

The forgings you need may not be round like the ones shown here. But whatever your designs, they can be made at Bethlehem and made the way you want them. Whenever we can be of service, call or write us.





BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

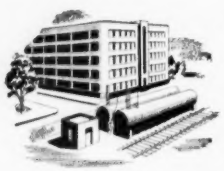
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

Bethlehem FORGINGS

America's Largest Selling Brand of LP-Gas...

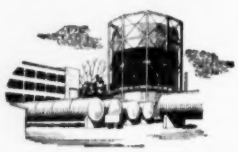
PHILGAS*

For Industries



Why do so many leading manufacturers rely on Philgas? Because this high-quality butane-propane fuel burns clean, there are no harmful contaminants to injure finished products. Fewer operational worries, too, with automatic Philgas systems maintaining constant temperature, atmosphere and pressure (high or low, as desired).

For Utilities



What advantages does Philgas offer utilities? Again . . . Philgas can be depended upon as a superior, reliable product . . . clean-burning and uniform in thermal values and gravity. Many progressive utilities find it profitable to augment natural or manufactured gas with Philgas. Automatic operation cuts down overhead.

*Philgas is the Phillips Petroleum Company trademark for its high quality propane-butane LP-Gas or bottled gas.

Phillips 66 Philgas
THE ALL-PURPOSE FUEL

PHILLIPS PETROLEUM COMPANY
Sales Department · Bartlesville, Oklahoma

Offices located in Amarillo, Tex., Atlanta, Ga., Chicago, Ill., Denver, Colo., Des Moines, Ia., Pontiac, Mich., Indianapolis, Ind., Kansas City, Mo., Milwaukee, Wis., Minneapolis, Minn., New York, N. Y., Omaha, Nebr., Raleigh, N. C., St. Louis, Mo., Tulsa, Okla., Wichita, Kans.

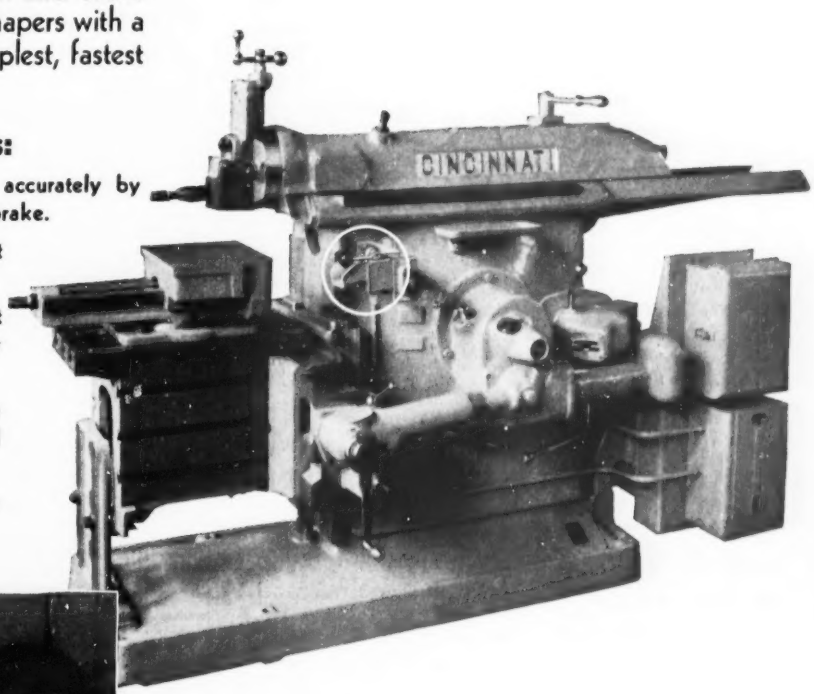
* Electro-Magnetic Clutch and Brake

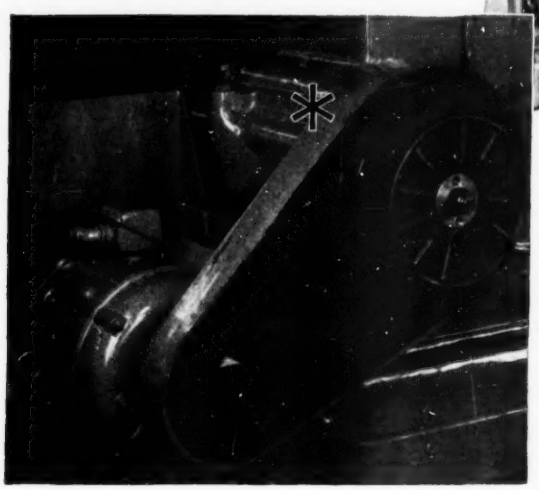
–another NEW on Cincinnati Shapers

Now, with one convenient control the new electro-magnetic clutch and brake start and stop Cincinnati Shapers with a finger touch. It is the simplest, fastest control on any shaper.

Important advantages:

1. Ram is positioned quickly, accurately by instant action of clutch and brake.
2. Starting and stopping by just a light touch.
3. The single control lever is at the most convenient operator position.
4. Clutch and brake operate without grab . . . are powerful and smooth in action.
5. No adjustment of clutch or brake is required.





This clutch and brake are standard on all new Cincinnati Shapers. They are Warner units which have been thoroughly proven on machine tools.

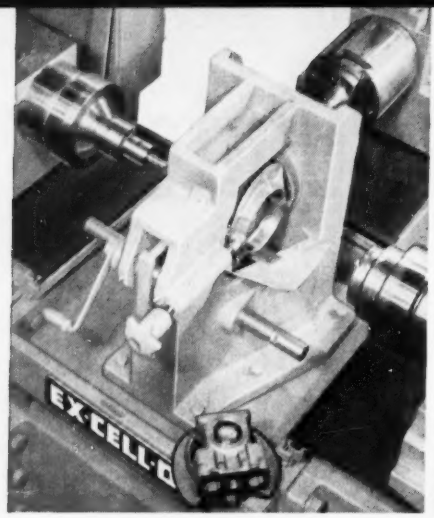
Write for complete Cincinnati Shaper Catalog N-5

THE CINCINNATI SHAPER CO.

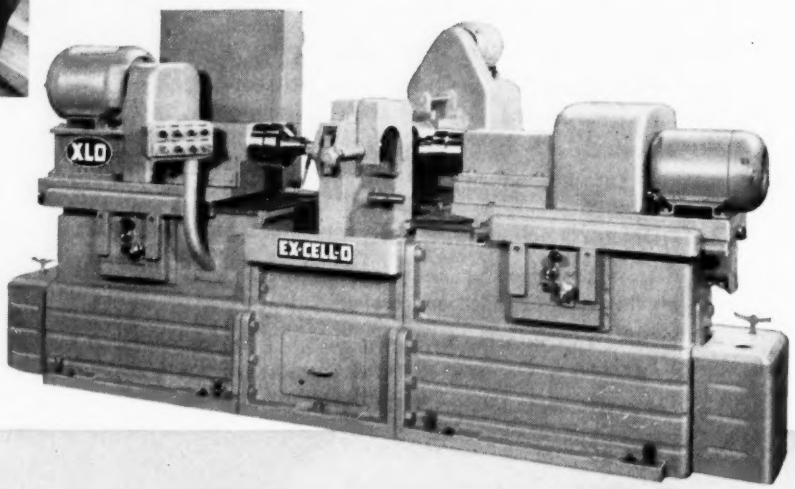
CINCINNATI 25, OHIO U.S.A.

SHAPERS · SHEARS · BRAKES

Combine Operations FOR PRECISION



Close-up view shows relatively simple tooling.



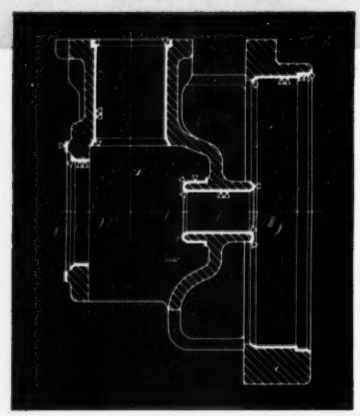
Ex-Cell-O Three-Way Precision Boring Machine.

COMBINING OPERATIONS CUTS COSTS, BOOSTS OUTPUT, PROMOTES ACCURACY

Once a part is properly located and clamped it's good practice to do as much machining on it as possible before it's moved. In this way the various operations can be held in accurate relationship to one another, production is increased, and handling time is minimized.

In machining this cast-iron refrigeration crankcase, five roughing and eighteen finishing operations are held in accurate relationship to one another, with extremely close tolerances on the crankshaft and cylinder bores. Net production for the roughing operation is 33 parts per hour; for finishing, 36 parts per hour.

Ask your local Ex-Cell-O representative about all the other advantages of Ex-Cell-O Way Machines, or write today for Bulletin 31631.



Sectional view with heavy lines to show operations. Single and double triangles indicate, respectively, single operation and rough-and-finish operations.

XLO
EX-CELL-O for PRECISION

EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS
DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

52-15

This Week in Metalworking

STEEL

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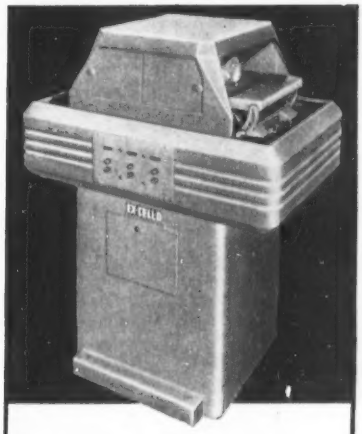


This Sturdy Precision

Tool Grinder

STYLE 44-A, is the newest in a complete line made by Ex-Cell-O for sharpening carbides, high speed steels, and cast alloys. All are double end models, equipped for face grinding on cup type wheels; for efficient and economical conditioning of single-point tools.

BULLETIN 46262, pictured below, shows and describes models for large plants or small shops; also gives important data on tool grinding. Ask Ex-Cell-O to send you a free copy. Write for it today.

XLO

53-27

For Better Work and Longer Life—

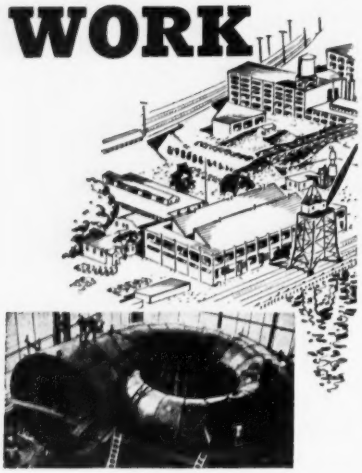
TOOL GRINDERS

BY

EX-CELL-O CORPORATION

Detroit 32, Michigan

STEEL PLATE WORK



TURBINE CASINGS and other heavy steel plate work are fabricated at Pusey-jones of Hot-Rolled, High-Strength, Low-Alloy Steel.

Every facility for large scale metal fabricating: — Heavy plate shop equipment — Rolls — Shears — Bending furnaces. Stress relieving furnace 33'x18'x16' up to 2100°F. Machine shop for facing, turning, and boring. 50 ton capacity gray iron foundry. Deep-water transportation on one side, the Pennsylvania RR on the other. Talk to our development engineers.

Metals Fabrication Division
THE PUSEY AND JONES CORP.
506 Front St., Wilmington, Del.
Established 1848

PUSEYJONES

Behind the Scenes...

Meet Art Zimmerman . . .

He's a long length of editor and when he wraps his 6 ft. one inch frame around a typewriter, he looks like the town bully beating the bejasus out of a noisy victim.

Art Zimmerman has been a member of the biggest and best editorial staff in metalworking for only one and one half years. He gives definite promise of becoming a real heavyweight now that he's had time to flex his editorial muscles.

You may remember his excellent articles on *Packaging* and his more recent effort on *Electronics* in which he collaborated with Assistant Editor Tom Hruby.

At first "howdy do", Art seems a bit intense and yet you'll find him capable of occasional breezy blasts that are entirely refreshing. You get the feel of his light side in the brisk manner in which he edits the Letters to the Editor pages of STEEL.

As a regular assignment, he turns out the foreign news each week. And, in addition to handling special features, he's final reader on all news section pages for typographical errors.

Here's a man with a mission . . . in fact, it's almost an obsession . . . and that's to break 120 on the local eighteen. He's one of those long-off-the-tee-far-to-the-right kind of golfers but, despite stratosphere scores and gentle jibes of Assistant Editors Bob Jaynes and Bill Wolfe with whom he plays most often, he claims that the game relaxes him.

Since when did golf relax anyone?

Ghosts

Associate editor Sam Baker over in New York says that Geraldine, the night editor-cleaning woman must be traveling over east on night assignments or has a big city cousin who works in the Lincoln building. Last Monday morning Sam found a piece of copy paper stuck in his typewriter. On it was this bit of gibberish:

The Game

One day two schools were thinking about a game.

The game was to be between Junk Yard and Canteen. The game was to be on Sat. Aft. at three o'clock sharp. Then the big game was njhgfvcxdfg jkkkkjhgfdssbmnvcx-asfdjuyyexftsts.

Everyone in the New York office swears they had nothing to do with it. After thinking it over, we've decided to make a job for Cousin Climaline as Eastern Sports Editor, so from now on you'll be kept right up to snuff on what all the smart money boys are doing down east that is.

We Love Salesmen!

"We Love Salesmen!" is the title of a booklet recently issued by the Standard Pressed Steel Co., Jenkintown, Pa. Vest-pocket in size and done with humorous cartoons in two colors, it is given to all salesmen calling on the purchasing department of this company. Among other things (map on how-to-get-there, where to park, what door to enter), it lists generally what this company buys to produce its socket screws, locknuts, steel shop equipment, et cetera.

Welcome to Penton

Welcome folders to be found in the reception rooms of plants and general offices are common-place nowadays and a mighty good public relations gesture they are. If you are interested in your firm's goodwill rating, it is worth your checking to see if you have such a printed folder or booklet. They need not be fancy and it's not important that they be produced in tremendous volume (although distribution to your own employees is in order). Yes, we have a welcome folder at Pentons, and will be glad to send you a sample if you just say the word.

Dead Heat

It was a photo finish between Murray C. Thaw of the Littel Steel Co., Inc., Fallston, Pa. and Laurence McKinney of James McKinney & Sons, Inc., Albany, N. Y. with the correct answers to our puzzler of March 23.

Both responses were postmarked on the date of the issue and arrived in the morning mail on March 24.

The answers, as if you didn't know, were as follows: Sam paid $240 for the cow and $40 for the calf. He sold them for $360 and made $60 profit on the cow and $20 profit on the calf.

Shrdlu

(Metalworking Outlook—Page 51)

raw dolomite vs. dead burned dolomite

RAW dolomite is without peer for routine "drying" of open hearth bottoms and is useful for banking doors and making up banks over the line. However, for bank and bottom maintenance, most operators have concluded that despite its low price raw dolomite is not a low cost refractory.

The difference in price between dead burned dolomite and raw dolomite is essentially a reflection of the difference in the amount of work performed on the two products by the supplier. The increase in refractory value exceeds the increase in price because of characteristics imparted to dead burned dolomite during processing.

To obtain the oxides of calcium and magnesium, the desired refractory constituents, dolomite must be calcined to drive off carbon dioxide amounting to about 50% of its weight. In the case of dead burned dolomite fuel for calcination is provided by the manufacturer, whereas with raw dolomite it is supplied by the steelmaker. The average lime kiln uses about 10,000,000 BTUs to produce a ton of calcined product. Thus in making a 200-ton heat, an open hearth using 100 pounds of raw dolomite per ton of steel, consumes enough fuel in calcination to refine 15 tons of steel!

Merely to get the same number of pounds of refractory oxides contained in a ton of dead burned dolomite requires handling about 2 tons of raw dolomite, with a like reduction in furnace capacity. However, substitution of raw dolomite on a 2 to 1 basis fails to recognize the vastly superior efficiency of dead burned dolomite as a maintenance refractory. The coalescing agent incorporated in dead burned dolomite during manufacture causes the refractory to *set fast and stay fast* at operating temperatures. Concurrently each grain is "shrunk" to about 47% of its original volume and sized to insure a well consolidated repair of maximum density and refractory oxide content.

In contrast raw dolomite calcines to high porosity and low density in the open hearth and in the absence of an integral bond sets erratically under the fluxing effect of slag soaked up from bank and bottom.

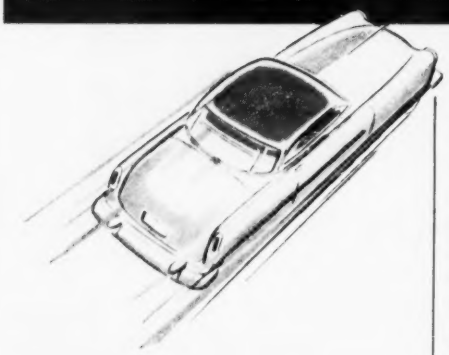
These are some of the factors that have dictated the steady 25-year swing to dead burned dolomite. During this period Basic Refractories' capacity for producing its dead burned dolomite products, Magnefer and Syndolag, has been expanded repeatedly to meet steelmakers' needs.

GRANULAR BASIC REFRACTORIES

Basic Refractories Incorporated

845 HANNA BUILDING, CLEVELAND 15, OHIO

Exclusive Agents In Canada: REFRACTORIES ENGINEERING AND SUPPLIES, LTD., *Hamilton and Montreal*



When you give the go-signal to Detrex, a skilled, well-coordinated team goes into high gear on your degreasing needs. One of our trained field staff surveys your operations, makes on-the-spot tests and demonstrations, and takes into consideration every factor that plays a part in overall degreasing efficiency. With this information, Detrex chemists and technicians from our laboratories join efforts with our equipment engineers to determine the type of degreasing operation best suited for your needs. Then, final recommendations are submitted to you along with actual performance data for the operation. *The results are guaranteed!*

Detrex guarantees results because only Detrex has complete control of the process from start to finish. Detrex is the world's leading manufacturer of degreasers—industry's largest direct supplier of trichlorethylene degreasing solvent. Detrex is the *only* company that produces both.

But Detrex service does not stop with delivery on your order. The Detrex Field Service Engineer visits your degreasing operation regularly to make sure it continues at maximum efficiency and economy. He will point out ways to conserve solvent and increase production. Detrex assists in the training of operators and supervisors. In effect, they become skilled advisors on your staff without fee. There is absolutely no charge for the service . . . it comes automatically to Detrex customers.

Give the go-signal to Detrex on your degreasing operations. It will save you money, assure results.

for free survey

At no obligation to you, the Detrex field man in your area will come in and survey your present or proposed operations. There is no cost for the service. The result will prove to you the money-saving advantages of Detrex service. Just fill out and mail the coupon below . . . our field man will call you for the most convenient time to come in.

DETREX CORPORATION,
Dept. 101, Box 501, Detroit 32, Michigan

Please have the Detrex man in our area make an appointment to survey our operations to point up ways of cutting cleaning costs.

NAME .....

COMPANY .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

DETREX CORPORATION

DEGREASERS • DEGREASING SOLVENTS • WASHERS
ALKALI & EMULSION CLEANERS • DRYCLEANING
EQUIPMENT • PHOSPHATE COATING PROCESSES

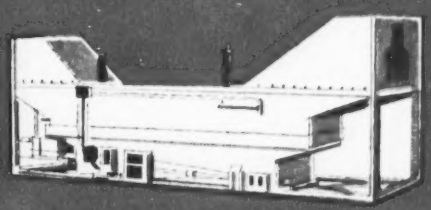
industry's most comprehensive metal cleaning service

chemicals

With large, modern trichlorethylene producing plants in Ashtabula, Ohio and Tacoma, Washington, Detrex is industry's largest direct supplier of degreasing solvent. Through a network of field stocks, Detrex distributes this solvent to industry in the most convenient and economical manner. Deliveries are made to customers upon orders direct to the nearest stock point. By the drum, by tank car, Detrex meets your solvent requirements with premium-grade Perm-A-Clor at regular prices. Detrex also provides perchlorethylene and other solvents when required for cleaning or other operations.

equipment

Detrex built the first modern solvent degreasing machine over twenty years ago. Today, Detrex is industry's leading manufacturer of degreasing machinery. Our engineering department in Detroit is staffed with men thoroughly familiar with degreasers . . . our plant is equipped for modern production of every type from the smallest hand-operated unit to the largest conveyorized type. If your part can be degreased, Detrex builds the equipment.



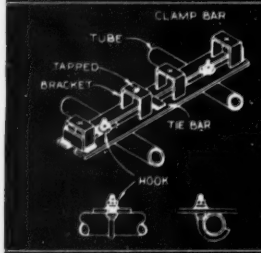
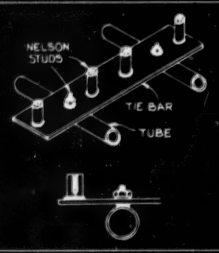
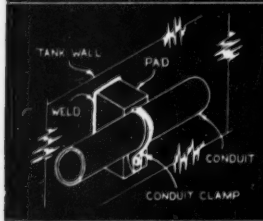
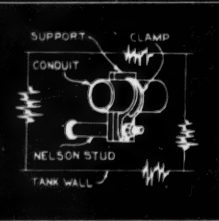
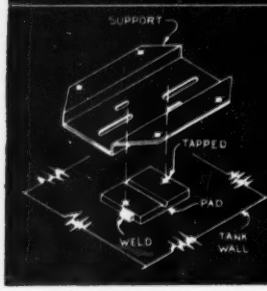
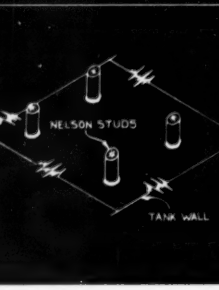
field service

Detrex maintains a nationwide staff of trained specialists for customer service. Their skills and their time are at the disposal of Detrex customers without charge. They make regular visits to customer plants to inspect degreasing operations and point up ways to improve quality and conserve solvent. They will train your operators and supervisors and offer suggestions for more efficient work-handling procedures. On new applications, they will work with your engineers and production men to determine most efficient cleaning procedures. The results of their efforts are substantial savings per year for Detrex customers everywhere.

research

Research is the keystone of Detrex product development. In fact it was Detrex research that developed the means to stabilize chlorinated solvents and thus made modern solvent degreasing practical. Today, extensive Detrex laboratory facilities are manned by competent specialists. The revolutionary new ultrasonic process of metal cleaning, "Soniclean" is just one example of Detrex continuing research. Detrex research objectives are two-fold; 1) to develop new and better chemicals and processes in pace with the changing needs of industry and, 2) to constantly search for ways to make present Detrex products serve you more efficiently and economically.

71% to 86% Savings by redesigning with NELWELD*

FORMER METHOD	NELWELD METHOD	RESULT
		75% SAVING with NELWELD
		86% SAVING with NELWELD
		71% SAVING with NELWELD

These substantial savings in fabrication costs were obtained when an electrical equipment manufacturer took advantage of the NELWELD method of fastening to redesign component parts. If you are now drilling/tapping or hand welding, chances are you too can . . .

Cut fastening costs, gain important corollary benefits—with NELWELD

In addition to slashing direct fastening costs, NELWELD pays off with such important corollary advantages as: reduction in costly material handling . . . saving in steel by eliminating bosses, flanges, brackets . . . a saving in manhours required to assemble . . . increased production.

If you're ready to cut your costs, start by writing for the booklet, "How to Design for NELWELD."

*Trademark

Fasten it Better . . . at Less Cost, with NELWELD

NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

LETTERS TO THE EDITORS

A Timely Editorial Still

We have received 10 copies of "Now Is The Time" (Jan. 5, p. 111). But 10 copies will not be enough for our use. May we have your permission to have this article reproduced?

H. A. Miller
U. S. Steel Supply Division
U. S. Steel Corp.
Chicago

• *Permission granted.—ED.*

Electronics Simplified

I find your article "Industrial Electronics" (Mar. 16, p. 96) very interesting indeed and I think you have done a very neat job on a very complicated subject. You have my congratulations.

D. C. Lynch
vice president
Brush Electronics Co.
Cleveland

I read carefully through your article on electronics in STEEL. I found the story to be most informative and certainly helpful to me. While I cannot check on the accuracy of all your data, the statistics on industrial research and development were reported correctly.

Kenneth S. Colman
Research & Development Board
Washington

I read your article "Industrial Electronics" with interest. I would like to know more about the theory of transistors and also can you supply me with the name and address of a manufacturer?

L. F. Geremia
Engineering Department
Connecticut Telephone & Electric Corp.
Meriden, Conn.

• *Write to Mr. R. K. Honaman, director of publications, Bell Laboratories Inc., 463 West Street, New York 14. Since Bell Laboratories did much of the pioneering work on the transistor and have granted some 34 operating licenses for work on the transistor, they will be able to supply you with the information you desire.—ED.*

Two Sides of Doing Business

I appreciated very much your editorial "Now Is the Time" (Jan. 5, p. 111). I can only say "Amen" to all that your editors have written. But, it seems to me that the trouble is a little more basic even than what they have portrayed.

Here is why I think so: For the last twenty years, business has been ridiculed, its aims have been misconstrued, its policies have been laughed at, and, what is more important, its public relations policies have been almost non-

Continued on following page

tool steel is our special pride!

Just as mother was known for a special dish, so Crucible stands for the finest in tool steel. For a half-century we have enjoyed this reputation. Naturally, we are proud of it.

We are keeping our research and development in step with industry's everchanging needs for tool steel. We are offering you the benefits of our metallurgical service to solve unusual problems. And we are maintaining full stocks in conveniently-located warehouses so you can get prompt delivery of tool steel.

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Halcomb 218
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Ketos®
Airkool Die Steel
Airdi® 150
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CSM 2 Mold Steel
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Company_____ Title_____

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9" diameter, 3-colors

CRUCIBLE first name in special purpose steels

53 years of Fine steelmaking

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This NEW METHOD DRIES AIR

PRECISELY as you want it

- to control your product's quality
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- to increase your air conditioning capacity
- to DRY large quantities of fresh air from outdoors

The Niagara's Controlled Humidity Method using HYGROL moisture-absorbent liquid is

Best and most effective because . . . it removes moisture as a separate function from cooling or heating and so gives a precise result constantly and always. Niagara machines using liquid contact means of drying air have given over 20 years of service.

Most reliable because . . . the absorbent is continuously reconcentrated automatically. No moisture-sensitive instruments are required to control your conditions.

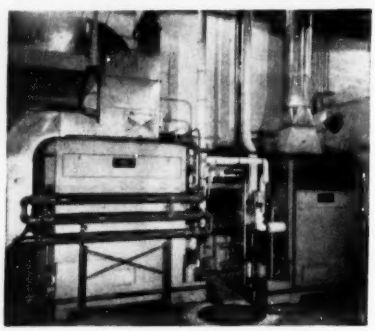
Most flexible because . . . you can obtain any condition at will and hold it as long as you wish in either continuous production, testing or storage.

Easiest to take care of because . . . the apparatus is simple, parts are accessible, controls are trustworthy.

Most compact, taking less space for installation.

Inexpensive to operate because . . . no re-heat is needed to obtain the relative humidity you wish in normal temperature ranges and frequently no refrigeration is used to remove moisture.

The cleanest because . . . no solids, salts or solutions of solids are used and there are no corrosive or reactive substances.



Niagara Controlled Humidity Air Conditioning

This method removes moisture from air by contact with a liquid in a small spray chamber. The liquid spray contact temperature and the absorbent concentration, factors that are easily and positively controlled, determine exactly the amount of moisture remaining in the leaving air. Heating or cooling is done as a separate function.

For complete information write

NIAGARA BLOWER COMPANY

Dept. S, Lexington Ave., New York 17, N. Y.

District Engineers in Principal Cities of United States and Canada

LETTERS

Concluded from preceding page

existent. The result is that in the mind of the public, businessmen generally have a tail and two horns on their head. How to overcome this attitude is the prime problem we are facing and it seems to me that one way of doing this would be to point out in the public print how much business is doing. For instance, the matter of taxes.

The other evening I was reading some figures about General Motors Corp. The article said, in a very casual way, that General Motors paid more than $2 billion in taxes. We might explain how each company pays certain amounts in local, state and federal taxes; we might point out how much it costs a given company to make payroll deductions for federal income taxes and for bonds, and for all the other things that are deducted.

It seems to me that something like this would start some of our people thinking. It might even result in a better understanding by the general public of businessmen's problems.

E. J. MacKenzie
advertising manager
Simplex Wire & Cable Co.
Cambridge, Mass.

An Old Friend Returns

Beginning with your next issue of STEEL, please renew my old subscription. Up until the first of the year, I had been a regular subscriber to STEEL for 15 or 18 years. I now find that I miss the reports, analyses of things to come (which have proven very accurate) and other news of the steel industry so much, I ask that you renew my subscription.

A. E. Donnell
P.O. Box 855
Goldsboro, N. C.

Galvanizing Compound Sought

We should be grateful if you could put us in touch with the makers of the new cold galvanizing compound mentioned in your article "Protects Iron and Steel" (July 21, 1952, p. 128).

J. H. Harris
Department of Geological Survey
Dodoma, Tanganyika
Africa

• *That firm is Galvanite Corp., 40 West 29th Street, New York.—ED.*

Symbol of Leadership

We want to thank you for your "Specifications Handbook" on ferrous and nonferrous materials, and we believe it is the most complete handbook that we have seen.

This type of service, I am sure, is appreciated by all industries in general, and indicates your leadership in this field.

J. D. Putterbaugh
purchasing agent
Waco Aircraft Co.
Troy, O.

Count on

WEIRTON

HIGH-CARBON STRIP
COLD-ROLLED SPRING STEEL

for uniform high-speed blanking and cold forming

Whether your problem is cold forming or blanking, you can depend on Weirton cold-rolled spring steel for best results. It has proved itself in a multitude of applications by consistently meeting the requirements of a variety of products where high fatigue-resistance is a principal factor.

Where superior forming qualities are of prime necessity, Weirton supplies spheroidized-annealed cold-rolled spring steel. The controlled grain structure provides exceptional ductility—assuring you of simple, economical fabrication.

Weirton also supplies cold-rolled spring steel that is temper rolled to produce controlled ranges of hardness and tensile strength. The desired ranges are designed to meet your specific requirements—assuring you of clean, economical blanking.

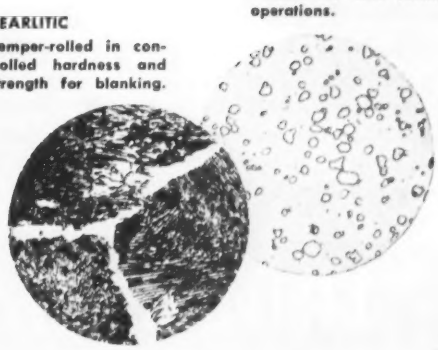
Close manufacturing control has resulted in these highly desirable qualities—unique in Weirton high carbon strip:

Accurate response to heat treatment.
Uniformity of gauge and width.
Uniform chemical and physical properties.
Exact consistency of grain structure.
Controlled decarburization limits.

Weirton high carbon strip is available with the desired chemical analysis and for specific heat treating and hardness ranges, in widths up to seven inches.

SPHEROIDIZED
Annealed, soft and ductile —ideal for cold forming operations.

PEARLITIC
Temper-rolled in controlled hardness and strength for blanking.

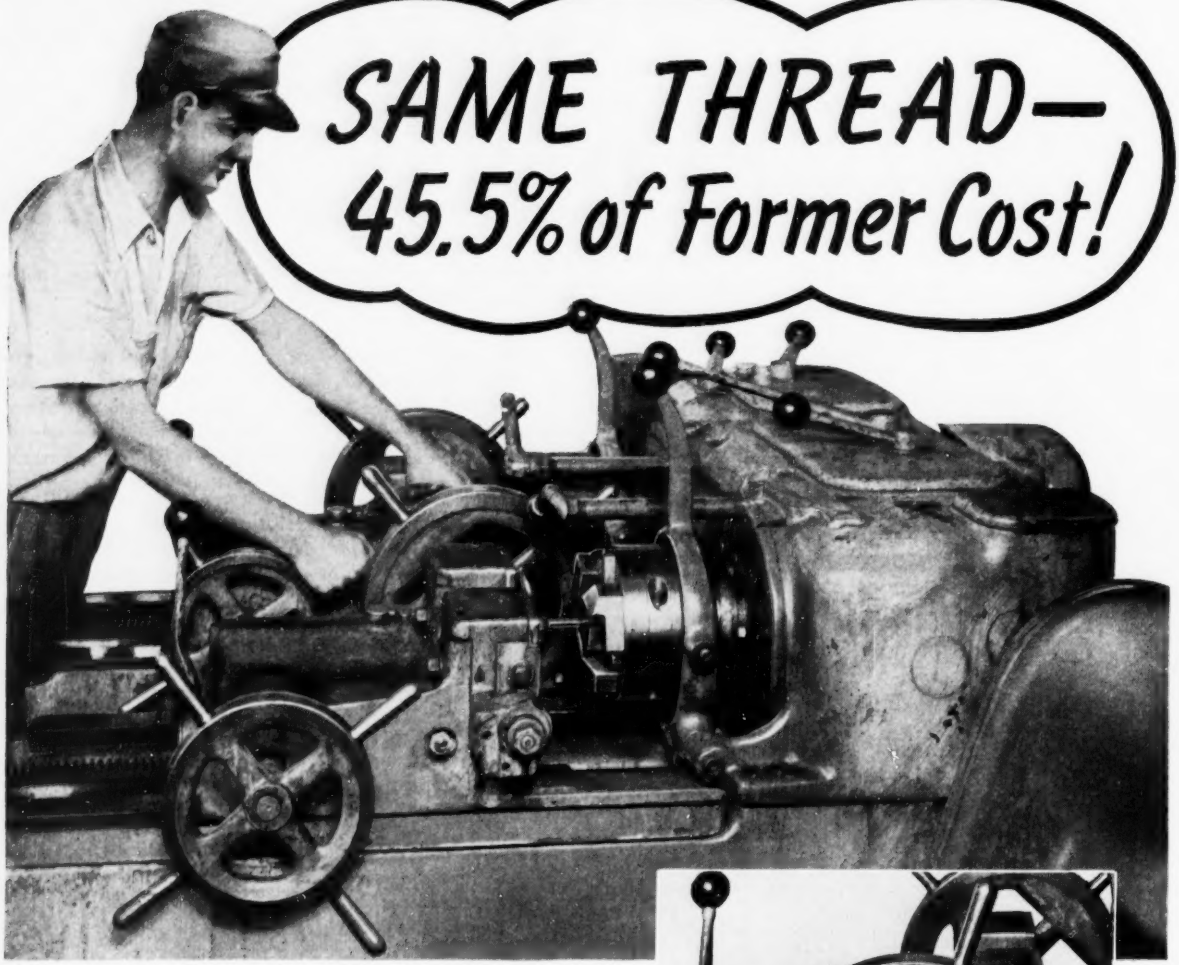


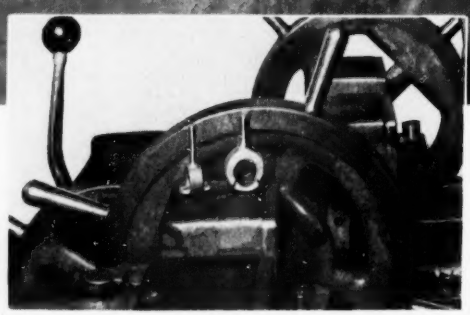
WEIRTON STEEL COMPANY

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

SAME THREAD— 45.5% of Former Cost!





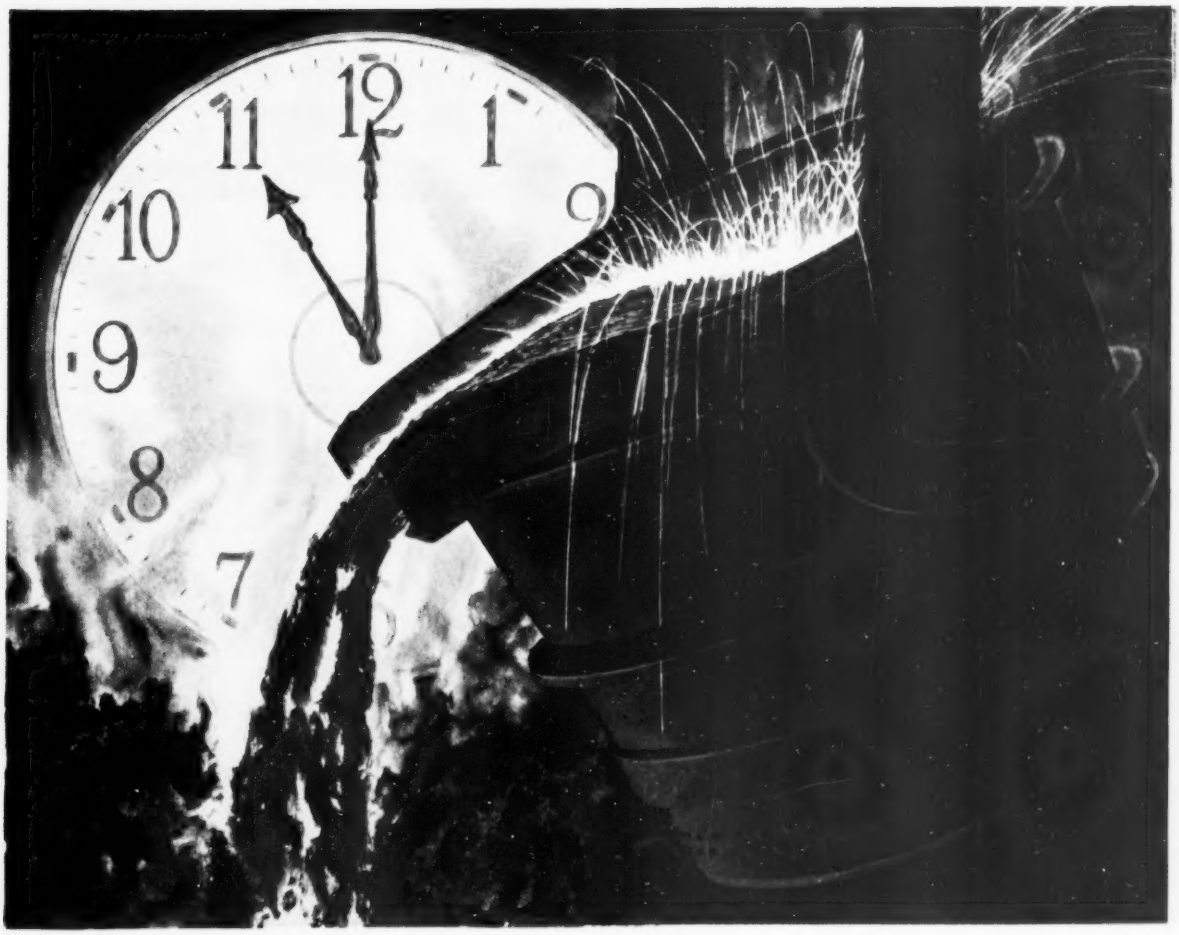
Eye bolts, for use in the assembly of switchgears, are now threaded on 1" Double LANDMACO Leadscrew Threading Machines in the Philadelphia plant of a large Eastern manufacturer. Records show that costs by previous methods averaged 120% higher.

Three sizes of eye bolts are threaded from high tensile bronze and copper castings—3/8", 1/2", and 5/8". 16, 13 and 11 pitch National Coarse threads respectively are cut for lengths varying from 15/16" to 1 5/8" at cutting speeds of 302 and 217 RPM's.

Lower tool cost has been an important factor in the overall cost reduction from threading these parts with LANDIS Equipment. Approximately 25,000 pieces are produced between each regrinding of the chasers. This combined with the fact that LANDIS Chasers are reground and used for most of their original length has brought tool cost down to a minimum.

This is one of many examples where LANDIS Threading Equipment has significantly reduced operating costs—others show increased production, better quality, lower maintenance, etc. Further information on LANDMACO Leadscrew Machines and all LANDIS Threading Equipment will be furnished promptly on request. Please give specifications when writing.

THE LANDIS *Machine* CO. 50TH ANNIVERSARY **WAYNESBORO PENNSYLVANIA**



Extra Tonnage every hour... WITH PERMANENTE 165!

Reports from leading steel producers using Permanente 165 ramming mix for open hearth bottoms show that:

Many furnaces are "tripling"... original tap holes are lasting up to 80 heats without repiping . . . production records are being broken, with extra tonnage every hour.

Chances are that the proved superiority of a Permanente 165 bottom, based on records of scores of furnaces, can boost *your* open hearth production well above current rates.

Such performance is possible because patented Permanente 165 is a high MgO *periclase* ramming material derived from sea water magnesia of highest purity.

Pre-shrunk and accurately sized periclase grains assure a bottom of great volume stability—another of Permanente 165's more than *20 quality advantages.*

SEND FOR LITERATURE giving *all* the important advantages of Permanente 165 and the companion material, Permanente 84. Upon request, your Kaiser refractory engineer will promptly offer you research, design and installation service to help you obtain more steel tonnage per year, at lower bottom cost per ton. Call or write principal sales offices: *Chemical Division,* Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California. First National Tower, Akron 8, Ohio.

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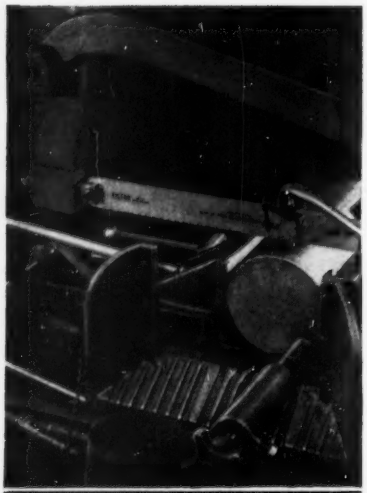

EFFICIENT CUTTING...
LONG BLADE LIFE...
plus at least
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with
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Do your toughest metal cutting jobs efficiently, economically and *right* with VICTOR "Moly" High Speed Power Blades.

To begin with, you'll reduce your initial blade cost by 15%. From then on, you'll find additional savings in better cutting and longer blade life. Quality steel, carefully heat treated, fabricated on special machinery, has made VICTOR Blades industry's preferred blades for over half a century. And your Industrial Distributor will give you free copies of the VICTOR Metal Cutting Booklet which tells you what blade to use for every job. Ask him for it.

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INDUSTRIAL DISTRIBUTOR

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Makers of Hand and Power Hack Saw Blades, Frames and Metal Cutting Band Saw Blades

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ANACONDA FORUM
for the Electrical Industry

THE IMPORTANCE OF
PRODUCTION METHODS ANALYSIS
IN INDUSTRY

by Robert G Ely, Vice President
The Connecticut Light and Power Company

LOWER production costs, always a major concern of industrial management, have, due to inflationary pressures during the past several years, become the vital element of survival in our competitive markets. Fortunately better production methods, coupled with enlightened depreciation practice that provides for prompt replacement of obsolescent productive equipment, enable our industrial customers to stay in the race. And fortunately, America's engineers are past masters at continually developing better production methods. The pioneering work of Dr. Frank Gilbreth in time and motion study laid the groundwork for a fascinating field of engineering encompassing the fundamentals of continued profitable operation in any industrial activity—that of Production Method Analysis.

FROM RAW MATERIAL TO FINISHED PRODUCT

Production Method Analysis studies the operation from raw material to finished product—the method of handling materials, the sequence of operations and their logical physical relationships, the individual operators and their activities. It also studies bottlenecks of production, such as poor or obsolete equipment, inadequate wiring with its consequent voltage problems and decreased production rates, inadequately trained personnel, or lack of proper tools. In short, Production Method Analysis breaks down apparently complex operations into their simple component parts. From such analyses and the subsequent use of modern, high-speed, automatic machines properly tooled and in proper sequence, along with effective materials handling and efficient personnel who know their jobs, comes the healthy industrial employer who is so vital to the well-being of the community and, incidentally, to the utility serving that community. And therein lies our very real interest in Production Method Analysis.

INDUSTRIAL PAYROLLS VS. UTILITY INCOME

There is no mathematical sleight-of-hand involved in developing the relationship of industrial payrolls to utility income in any community or group of communities. Unable to pull up poles and move to where the grass may look greener, and confined to its franchise territory in its quest for new business, the utility's prosperity directly reflects the general prosperity of its service area. Lower production costs, therefore, become of vital concern to us as well as to our customers. Production Method Analysis as a tool in increasing production rates and reducing unit costs has therefore become part of our vocabulary, part of our thinking, part of our program of doing our utmost to help our manufacturers maintain and improve their competitive positions within their own industries.

ELECTRICAL EQUIPMENT PLAYS A PART, TOO

Our allies in the electrical equipment field have an important part in this program too. This is for the reason that better production methods depend on the availability of a sufficient supply of power in the right place at the right time, ready for application to the job of increasing the effectiveness of manhours through efficient transformation into mechanical or heat energy for the accomplishment of industrial tasks. Generating stations, transmission and distribution systems, adequate plant wiring and well engineered utilization equipment are all necessary parts in the over-all picture of industrial and community growth and health. All who have a part in the supply of these facilities strengthen the backbone of better production methods.

ANACONDA JOINTING KITS prevent the possibility of inadequate materials . . . keep stocks fresh and readily available for fast withdrawals. Illustration shows how complete these kits are—right down to a handy checklist of materials.

ANACONDA CABLE ACCESSORIES

A complete line—engineered by power-cable experts—is available in increased quantities.

At Anaconda, the increase in demand for cable accessories is being met by increased production. The complete line—with many exclusive features—consists of the following:

Potheads (capnut, switchgear, transformer, disconnect and through types), featuring unmatched interchangeability of parts.

Unit Packages of Jointing Materials. These kits contain everything needed to make a joint.

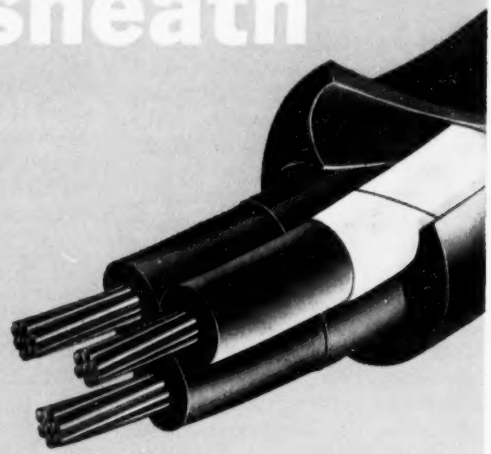
Filling Compounds. Balanced compounds mean greater stability.

Cable Paints and other miscellaneous accessory items.

Bring your cable and cable accessories problems to your Anaconda Representative.

Durasheath

the *all-purpose* ANACONDA Cable for both power and lighting services



Durasheath's* tough neoprene jacket stubbornly resists electrolysis, corrosion, temperature extremes, cutting, abrasion, impact, flame, oil, grease, moisture and most soil acids and alkalies.

Run it overhead, in ducts, or buried underground—or all three in one continuous run.

It's flexible, easy to handle, economical to install; made in single or multi-conductor construction.

Your nearest Anaconda Sales Office or Distributor can show you why it's good business to install this versatile, all-purpose cable. Just ask them.

*Trademark

TEN BASIC RULES FOR INDUSTRIAL WIRING

BY FRANK AIME, veteran electrical engineer of Anaconda Wire & Cable Company.

Successful operation of an industrial plant depends on the quality of its electrical distribution system. These rules should help in setting up a well-planned system for both large and small plants:

1. Design the system within supply limitations.
2. Locate supply near electrical load centers.
3. Know your load requirements.
4. Let requirements of processes, production and relative importance of the major characteristics of distribution systems determine distribution system type.
5. Select and arrange feeders and equipment so that interruptions never occur more than the process will allow.
6. Select all components from source to load for reasonable future growth.
7. Don't be limited by National Electric Code figures for conductors, conduit and protection which are minimum and primarily for safety.
8. Use load centers when feasible.
9. Select cables with best all-around characteristics for your condition.
10. Aim always for production efficiency, quality and safety.

ANACONDA RESEARCH AT WORK

How a new problem meant a new product

The problem? Loads had outgrown duct space and duct sizes of lead-covered cables. Cables had to be run hotter and under more severe physical difficulties. Cable *sheaths* were failing before *interiors* . . . cable life was limited.

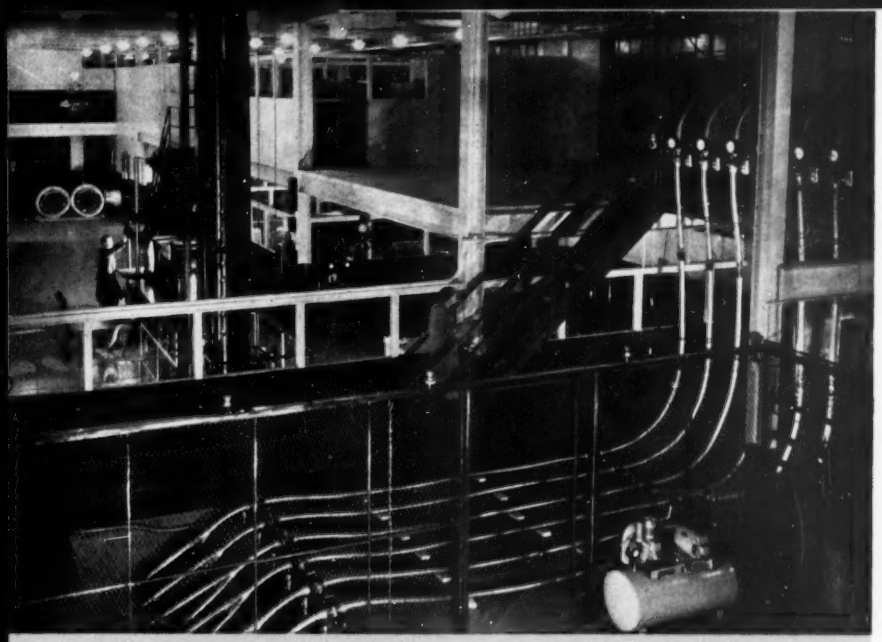
Anaconda research set out to find the answer. Hundreds of sheath alloys were tested. The one finally selected promised far better performance. Called ANACONDA F-3† alloy-lead sheath, it has a high burst strength and a low creep rate . . . resists bending and does not age-harden.

Once again, Anaconda's planned program of research solved a new problem with a new product. Yes, research like this pays off . . . in cable that serves you better!

RESEARCH IS ANACONDA'S BUSINESS, TOO!

†F-3 Arsenic-Lead Alloy (U. S. Patents 2,300,788, 2,375,755, 2,504,600 and 2,570,501) Reg. U. S. Pat. Off.

ANACONDA®



CYCLIC AGING TEST. Here's one method Anaconda Engineers use to learn how lead-covered, paper-insulated cables stand up. In this laboratory, cables are loaded under conditions similar to daily load cycles in the field, but at higher temperatures and voltages. Result: Anaconda Engineers get the facts fast . . . know what can happen years hence . . . and can give you much more reliable performance data.

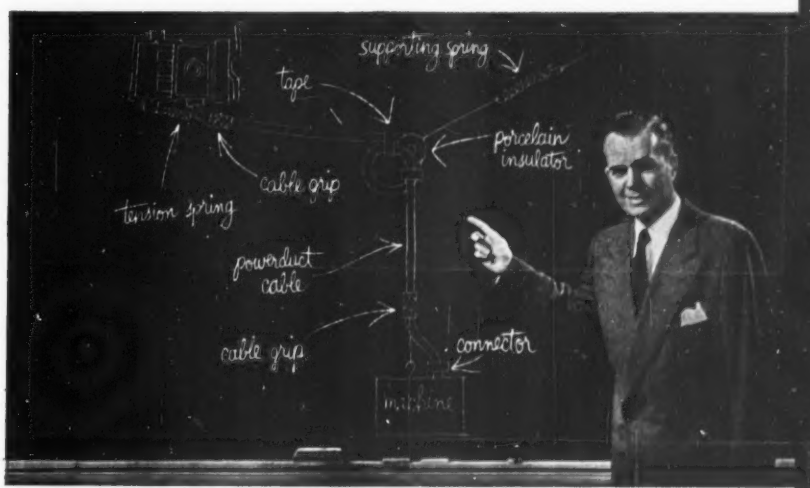
WHY THIS MAN'S JOB MEANS BUILT-IN QUALITY IN THE CABLE YOU BUY

THIS IS ED GITTLESON, Anaconda's Chief Inspector and Manager of Quality Control.

Ed knows that to make a good product and sell it at the lowest possible price, quality must be built in right from the start. That's Ed's job—to see that it's done from raw material to final shipment. Ed has based Anaconda's control program on principles of statistical quality control that assure you not only of *greater* uniformity, but of a *higher level* of quality as well. You can be sure that every Anaconda product more than complies with your requirements.

No busduct system is truly flexible without this New ANACONDA® Powerduct Cable

It's the only nonmetallic-armored busdrop cable UL approved for this hard use; cuts cost of relocating machines.



Even if you have a modern busduct system, it may be flexible only so far as it goes. You may still have to rip out permanent or semi-permanent wiring every time you rearrange important machines. That's costly.

Why not match your busduct system with money-saving ANACONDA Powerduct Cable . . . approved by Underwriters' Laboratories, Inc., for busway branches under section 3646, 1951 National Electric Code?

Powerduct Cable is much cheaper to install than conduit. It handles easily. Grips prevent cable creep. No time is lost. You get circuit capacity at any point for any load at any time. Coil (see illustration) makes local changes easy.

Its tough jacket takes heavy mechanical abuse, is flame-retardant, won't fray. Cold-flow is no problem. Cutting compounds, oil, acid, water, grease won't harm it.

Plan now to add flexible Powerduct Cable to your busduct system. Be sure that you insist on the ANACONDA Trademark—your positive proof of UL approval for this use.

the right cable for the job

SHORTS THAT MAKE SENSE

PRODUCTION TOOL. Good lighting is important in any plant. With it—high quality, profitable production and fulfilled schedules are possible. Without it—spoilage, reduced efficiency, lowered quality control and poor morale may send costs skyrocketing.

ADEQUATE CIRCUITS. A lighting system is no better than the circuits that serve it. Lamp efficiency, for instance, depends on operation at rated voltage. Make sure your circuits are adequate.

PLANNED SYSTEM LAYOUT. Lack of planning never pays off. A well-designed system always costs less than a poor one. Plan for tomorrow and you cut tomorrow's costs *today*.

TOMORROW'S LIGHTING NEEDS. Many plants install lighting circuits in working areas for an ultimate of two times present lighting intensity. Play smart and follow suit. You won't be caught with your lighting down.

CURRENT RATING. No one value of current-carrying capacity (amperes) can be assigned to any one size and design of cable. Installation and method of operation must be considered.

CABLE TERMINATIONS. Moisture, like death and taxes, plays no favorites. In making cable terminations, it pays to keep this in mind—even at low voltages. There tightness against moisture is just as important as for higher ratings. Yet it's here that failures are far more frequent. Probably due to the feeling that here anything will do in the way of terminating the cable.

OVERHEAD VS. UNDERGROUND. For appearance' sake only, overhead distribution systems are often replaced by more expensive underground systems. But it's entirely possible such a change will also result in a lower annual cost. Reason: freedom from damage by trees, wind, sleet, ice, etc. Reliability is improved.

"LIVE"
INSULATING
OIL

Heat and electrical stress produce deterioration products which eventually sign the death warrant for insulating oil. Carbon black keeps such oil "alive." It minimizes and removes deterioration products and keeps them outside the field of the dielectric. It continually purifies and stabilizes the oil . . . keeps it clean.

Only ANACONDA Type CB* Power Cable utilizes this phenomenon. Result: greater stability and longer life. This tested paper cable may be obtained with special carbon black binder which adds resiliency, yet possesses adequate strength. A further improvement, F-3** Alloy-Lead Sheath, triples sheath life by its high resistance to slow-bending fatigue, creep, burst and abrasion.

If you're not using Type CB Power Cable, you aren't getting as much service out of your paper cables as you should. We suggest you get the full story from your nearest Anaconda Sales Office.

* CB—Carbon Black (U. S. Patents 2,102,129, 2,405,853) Reg. U. S. Pat. Off.

** F-3—Arsenic-Lead Alloy (U. S. Patents 2,300,788, 2,375,755, 2,504,600 and 2,570,501) Reg. U. S. Pat. Off.

FOR FURTHER INFORMATION about any product mentioned in the pages of this advertisement, see your Anaconda Representative . . . or write to *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.*

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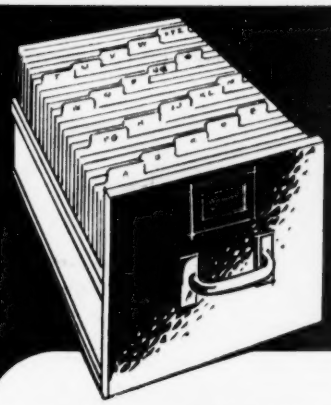
63382



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up-to-the-minute technical data on

CAST STAINLESS STEEL VALVES • FITTINGS • CASTINGS

1. STANDARD PRACTICE SP-42 . . . Eight page folder listing detailed specifications for 150# corrosion resistant cast flanged valves, flanges and flanged fittings.

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7. CAST STAINLESS STEEL IN THE PAPER INDUSTRY . . . Eight page folder describing how stainless steel castings, valves and fittings are used to beat corrosion in the paper industry

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15. CATALOG #52 . . . Forty-eight page catalog describing complete line of Cooper Alloy stainless steel valves, fittings and accessories. Includes engineering drawings, weights, dimensions, size ranges, plus valuable material and corrosion data.

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6	12	18

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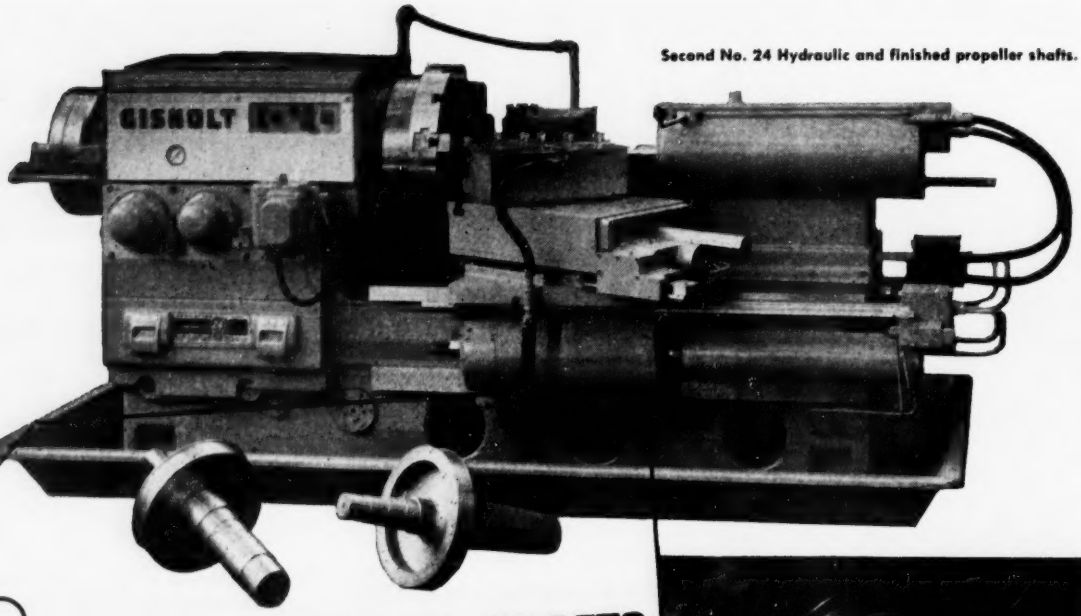
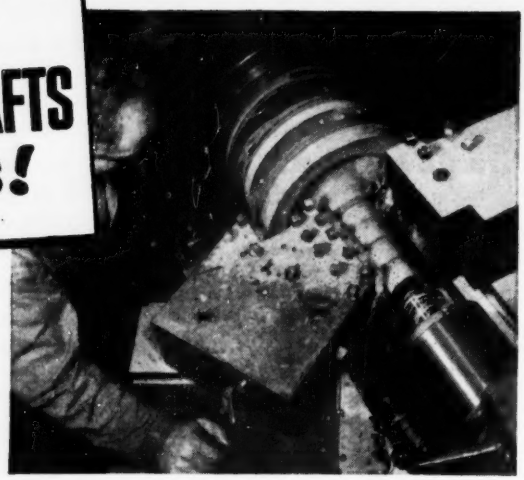


Second No. 24 Hydraulic and finished propeller shafts.

AIRPLANE PROPELLER SHAFTS AT BARGAIN PRICES!

from GISHOLT No. 24 AUTOMATIC LATHES

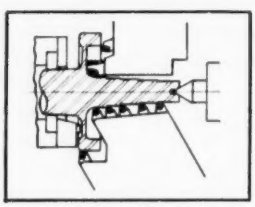


First No. 24 making chips on small end of shaft.

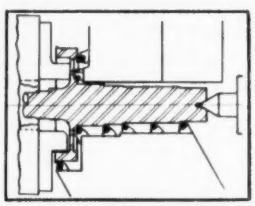
For speed and precision on these hefty drive gear and propeller shafts, production is divided between a pair of Gisholt No. 24 Hydraulic Automatic Lathes. The first machine gets the 275 lb. steel forging for nine different turning, chamfering, and facing operations on the 16″ gear blank and five-shaft diameters. 12 minutes later, the part moves to the second machine where nine tools perform similar work on the other side of the flange. Time again is 12 minutes.

Together, the two No. 24 Hydraulics remove a total of 75 lbs. of material. One man operates both machines. Another tough job handled to perfection by these high production machines.

The Gisholt No. 24 Hydraulic, like the famed smaller No. 12 combines ease of setup with exceptional speed and accuracy—all with fully automatic operation that means low costs on any job. If you have work up to 24″ diameter, you should have full details on the rugged, powerful, No. 24 Automatic.



Tool arrangement for first operation.



Tool arrangement for second operation.

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84-31

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ELECTROMET Data Sheet

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

How SILICOMANGANESE Saves Furnace Time . . . Produces Better, Cleaner Steel

Silicomanganese is used by the steel industry as a furnace block* and deoxidizer, and also for manganese additions.

The cleanness and quality of steel depend largely on how well it has been deoxidized. Deoxidation also greatly influences the physical properties of steel for rolling and subsequent fabrication. Silicomanganese combines two active deoxidizers in a single alloy and it has proved to be a more effective deoxidizer than silicon or manganese alloys added separately. This combination alloy contains silicon and manganese in the correct proportion (approximately 1 to 3.5) to be most effective in reducing the oxygen content of the bath to a low level. The use of silicomanganese produces cleaner steel, saves furnace time, and gives high alloy recovery for manganese additions.

Gets More Oxygen Out of Bath

When silicomanganese is used for blocking and deoxidation, the combined effect of silicon and manganese lowers the oxygen content to a greater degree than silicon alone. This is due to the fact that the amount of oxygen in equilibrium with a given amount of silicon is lower in iron-silicon-manganese alloys than it is in plain iron-silicon alloys, as shown in Fig. 1.

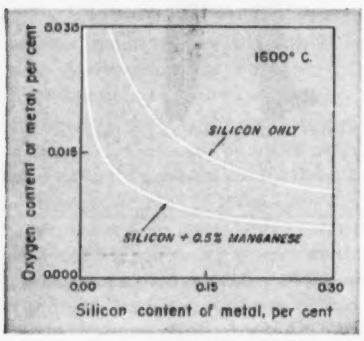


Fig. 1. Limit of solubility of oxygen in iron-silicon alloys, plain and with 0.50 per cent manganese at 1600°C.

*The initial deoxidation of steel, frequently referred to as the furnace block, stops the carbon-oxygen reaction in the furnace. This arrests the carbon drop immediately and makes it possible to secure close control of analysis. If the oxygen content of the metal is reduced well below the level established by the carbon-oxygen reaction, initial deoxidation is accomplished.

Less Inclusions, Cleaner Steel

In addition to lowering the oxygen content, silicomanganese has a specifically beneficial effect on inclusions. The inclusions in a steel depend in large part on how low the carbon content (or how high the oxygen content) is before blocking. The lower the carbon, the dirtier the final steel, almost regardless of the subsequent deoxidation treatment. Since silicomanganese has a low carbon content, it is not necessary to drive the carbon as low (or make the oxygen as high), as when high-carbon or standard ferromanganese is used, so that the final steel is cleaner and has better working properties. The improved cleanliness resulting from silicomanganese is usually noticeable in higher carbon steels, but is outstanding in steels below 0.25 per cent carbon where inclusions and surface defects are a vital problem and where the time saved by blocking at a higher carbon level is significant.

Fast Solubility In Bath

Because of the high concentration of active elements in silicomanganese, less time is required to effect solution of this alloy than when equivalent amounts of silicon and manganese are used separately in the form of ferrosilicon and ferromanganese.

For example, compare these typical analyses of silicomanganese, standard ferromanganese, and 50 per cent ferrosilicon:

	Silicomanganese, %	Standard Ferromanganese, %	50% Ferrosilicon, %
Manganese	66 5	80	—
Silicon	19	—	50
Carbon	1.5	7	—
Iron, approx.	13	13	50

From this it can be seen that 1,000 lb. of silicomanganese would contain 190 lb. of silicon and 665 lb. of manganese. These amounts of silicon and manganese would require 380 lb. of 50 per cent ferrosilicon and 830 lb. of standard ferromanganese, or a total of 1,210 lb. Obviously it is easier and faster to dissolve 1,000 lb. of the combination alloy silicomanganese than 1,210 lb. of these separate silicon and manganese alloys.

Lower Carbon Content

Silicomanganese contains less carbon than any combination of ferrosilicon and standard ferromanganese. Therefore, the carbon-oxygen reaction in the bath can be stopped earlier when silicomanganese is used for blocking. Heats can be blocked at higher carbon levels and hence lower oxygen contents, and the amount of deoxidation required is less.

Fig. 2. Charging silicomanganese into an open-hearth furnace.

Saves Furnace Time

Because of the advantages outlined, silicomanganese can save as much as 20 minutes per melt in the production of open-hearth steel. For low-carbon steel, an even greater saving in time can be realized.

For Producing Engineering Steels

Silicomanganese is also used for alloy additions of manganese, particularly in the production of engineering steels containing 0.10 to 0.50 per cent carbon.

When manganese or other oxidizable additions, such as chromium, must be made to the bath, the use of a block provides a higher alloy recovery. Silicomanganese introduces manganese with the silicon and the usual recovery of this manganese will range from 70 to 85 per cent.

Metallurgical Service Available

Ask to have one of our metallurgists call and explain more fully the advantages of silicomanganese as a furnace block and deoxidizer. He will be glad to help you with the use of ELECTROMET silicomanganese. This alloy contains 65 to 68 per cent manganese and is produced in maximum 1.50, 2.00, and 3.00 per cent carbon grades. All grades are furnished in a lump size of 75 lb. x 2 in. and in a crushed size of 2 in. x down. Write, wire, or phone the nearest ELECTROMET office.

The word "Electromet" is a registered trademark of Union Carbide and Carbon Corporation.

Which Square D Control Center will do *Your* job best?

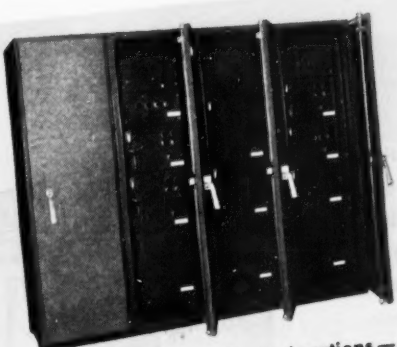
1. STANDARD
2. BACK-TO-BACK
3. DUST-TIGHT
4. WEATHER-PROOF
5. FILTERED AIR

1 Standard Square D Plug-in Control Centers in Nema I enclosures are designed for the majority of installations.

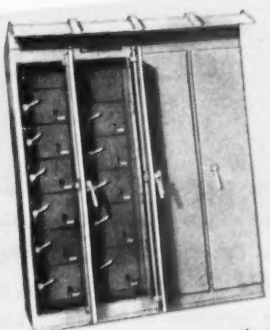
SQUARE D FOR FLEXIBILITY! Square D's plug-in units can be removed, added, or exchanged at will. Both fusible switch and circuit breaker types available. Standardized sections and units are 100% re-usable after plant conversions or rearrangements.

Write for Bulletin 8938. Address Square D Company, 4041 North Richards Street, Milwaukee 12, Wisconsin.

2 Space an Important Factor? Back-to-back Nema I enclosures provide maximum concentration of control in limited space.



3 for Excessively Dusty Locations—felt-gasketed, dust-tight, Nema V enclosure. A "natural" for foundries, smelting and refining plants.



4 for Outdoor Installations—rubber-gasketed, Nema III enclosure protects equipment from weather. Special rust-proof, vinyl-clad finish.

5 Need Filtered Air Protection? Built-in fan and filter combination pressurizes enclosure for moderately dusty or certain types of corrosive atmospheres.

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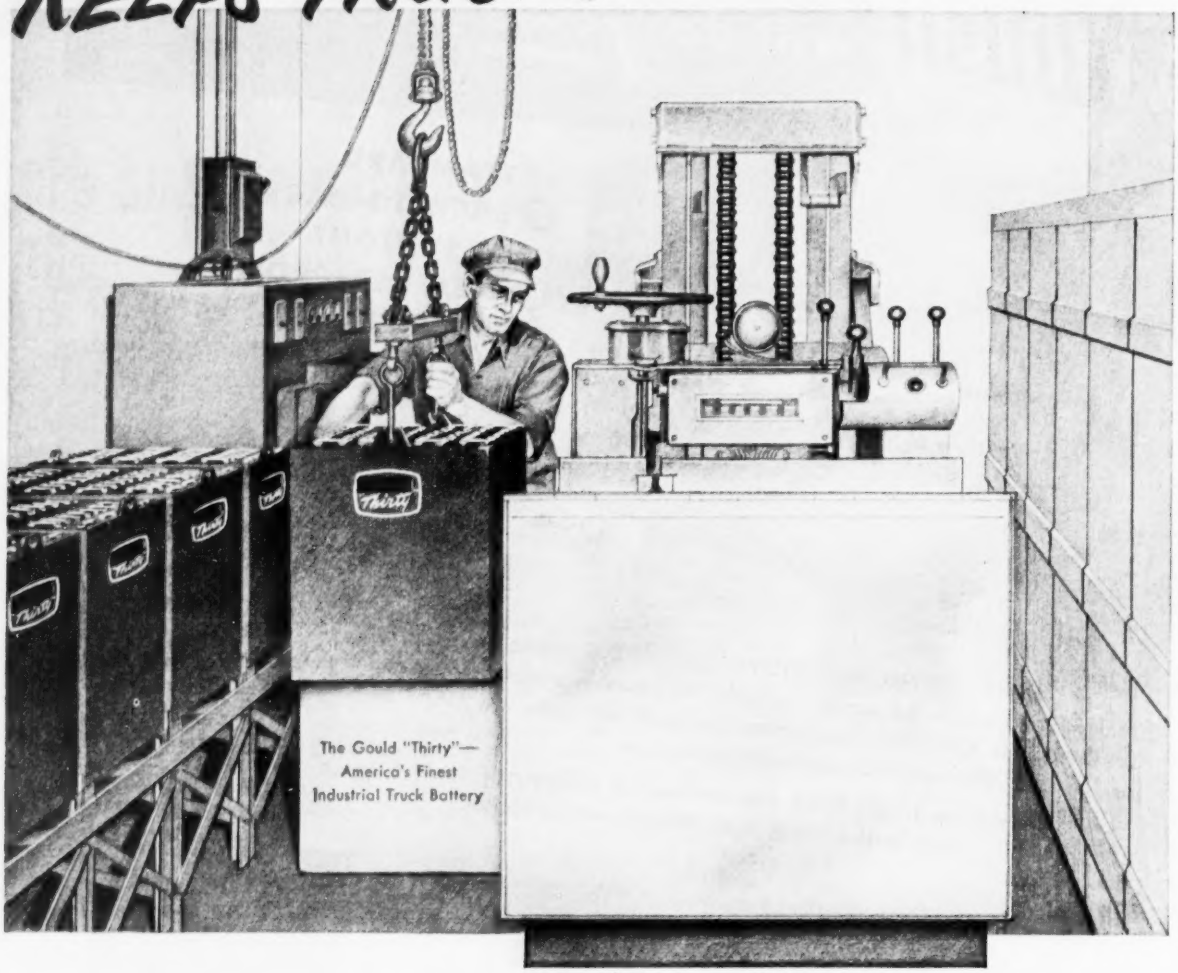

Nothing will keep your electric industrial trucks in continuous operation like a well-organized system of battery maintenance. And nothing can give you such a system like the Gould Plus-Performance Plan. Here is a complete library of technical information that tells how to select, charge, handle, maintain, and determine the condition of lead-acid batteries, regardless of make. Use it to systemize battery care and you'll cut down-time, maintain production schedules and extend battery service. It's free. Write Gould Battery Information Headquarters.

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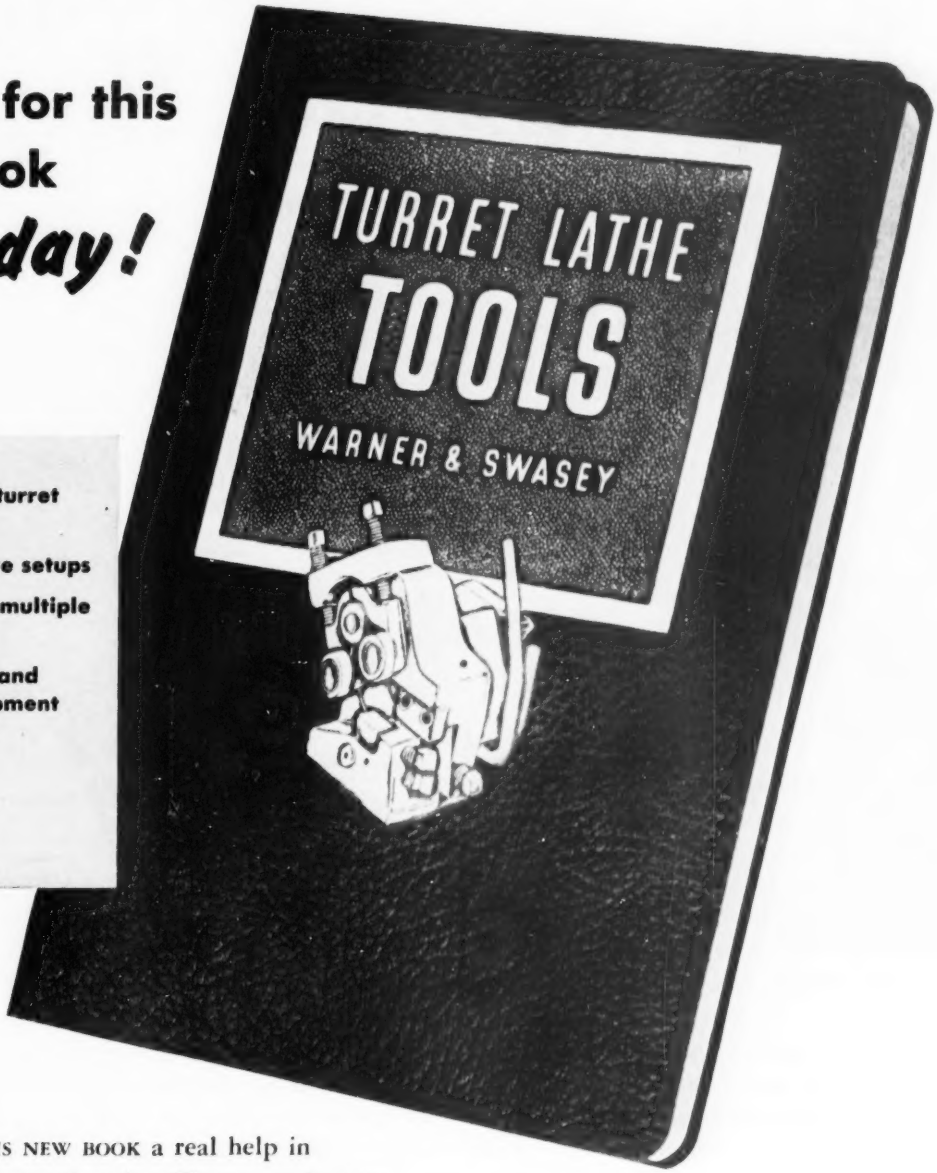

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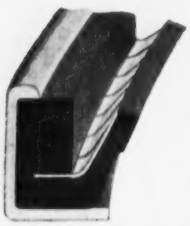
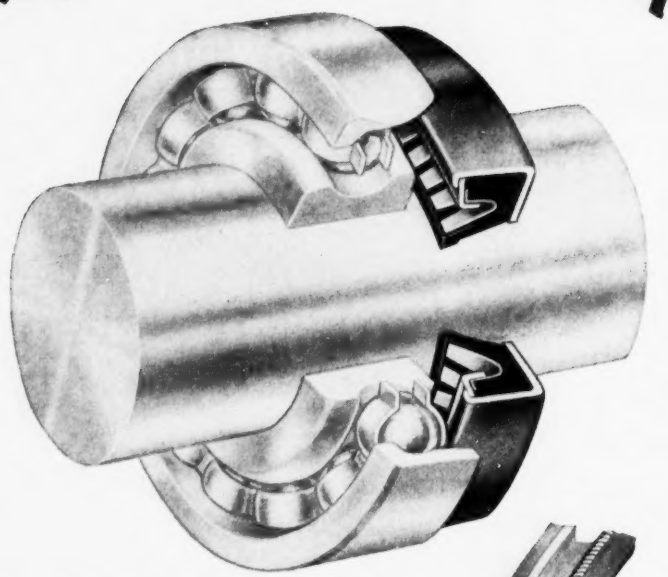
Best Bearing Protection Money Can Buy

Model 65—A general purpose garter spring seal for moderate speeds.

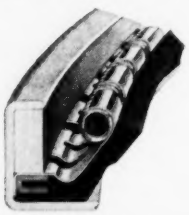


Model 63—A general purpose finger spring seal for normal and high speed service.



Model 53 KLOZURE applied to a shaft to protect the ball bearing.

Model 71-A—A narrow-rind springless seal for needle bearings and other limited space applications.



Model 64—A strong double spring seal for heavy duty service on large shafts.

Model 91-B—A narrow-rind seal with synthetic rubber outer covering for soft metal housings.

DEPENDABLE KLOZURE Oil Seals protect costly bearing installations; they prevent breakdowns and resulting losses in production. That's why many manufacturers of machine tools, gears, speed reducers, and other equipment have standardized on Garlock KLOZURES.

The standard sealing element in the Garlock KLOZURE is made of a synthetic rubber compound that is oil-resistant, non-porous and non-abrasive. Special elements, such as "Teflon" for strong acids and silicone rubber for extreme heat, are available. The metal cases are precision die-stamped.

These superior oil seals are made in a complete range of sizes and in many models; several are illustrated. *Write for KLOZURE Catalog No. 10.*

Branch Offices in Principal Cities

THE GARLOCK PACKING COMPANY, PALMYRA, NEW YORK

In Canada: The Garlock Packing Company of Canada Ltd., Toronto, Ont.

GARLOCK Klozure* Oil Seals

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Removal of Siliceous Volcanic Cinders — Redmond, Oregon

Caterpillar Tractor Co. Photo

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In Redmond, Oregon, a siliceous volcanic mountain is being leveled by powerful Diesel bulldozers. The volcanic cinders derived from this opencut mining operation when mixed with asphalt or concrete produce an excellent non-skid surface for modern highways especially in mountainous country.

The use of Diesel powered bulldozers to push this material into piles for mechanical truck loading, depicts American initiative and the trend to utilize industrial machinery to the utmost.

The Bullard Company for over 70 years has progressively created and placed in practically all industries of the world, Machine Tools that have led the way to greater production. Machine Tools which have helped produce these laborsaving machines as well as the numerous industrial, consumer and luxury items that comprise our American standard of living.

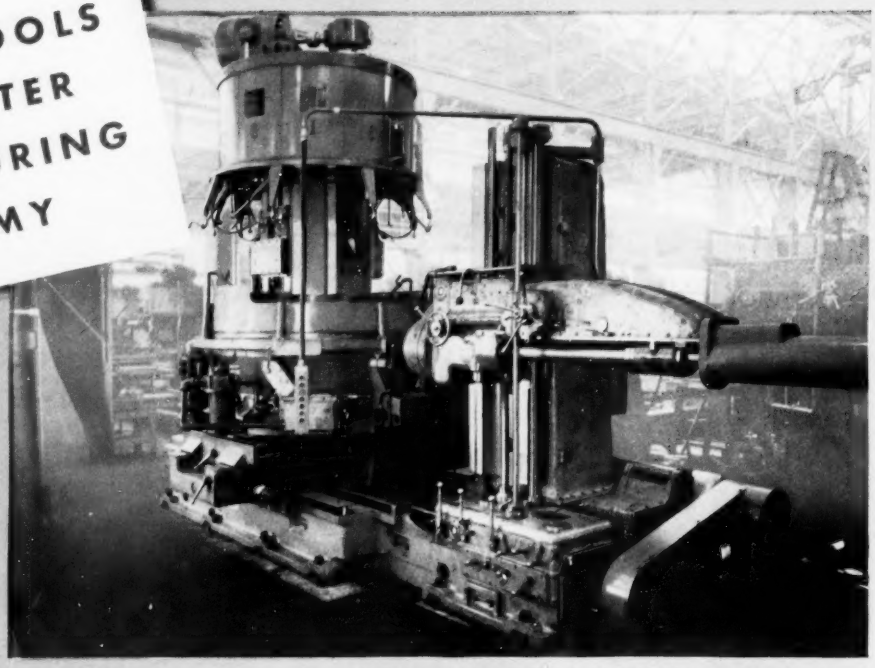
Bullard, through constant research and engineering, builds ★ *Modern Machine Tools* that are recognized for their accuracy, ruggedness, dependability, versatility and economy of operation. They are key production units for today's manufacturing plants.

★ *For greater manufacturing economy REFER to next page.*

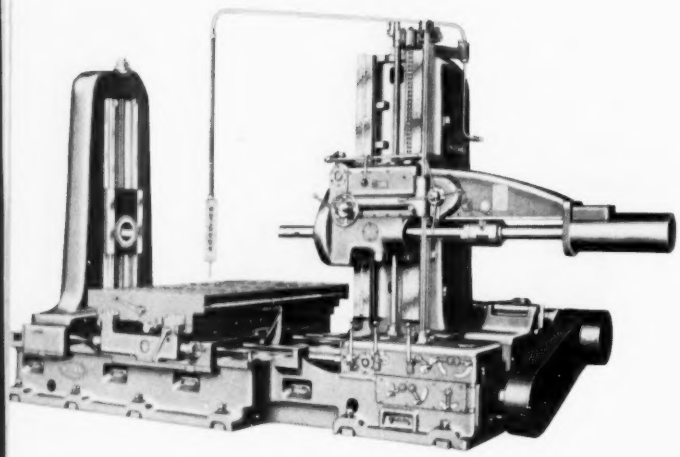
THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

BULLARD MACHINE TOOLS FOR GREATER MANUFACTURING ECONOMY



This 18½-ton Mult-Au-Matic was used to test the load carrying capacities of the Bullard 4-Way Bed Horizontal Boring, Milling and Drilling Machine.



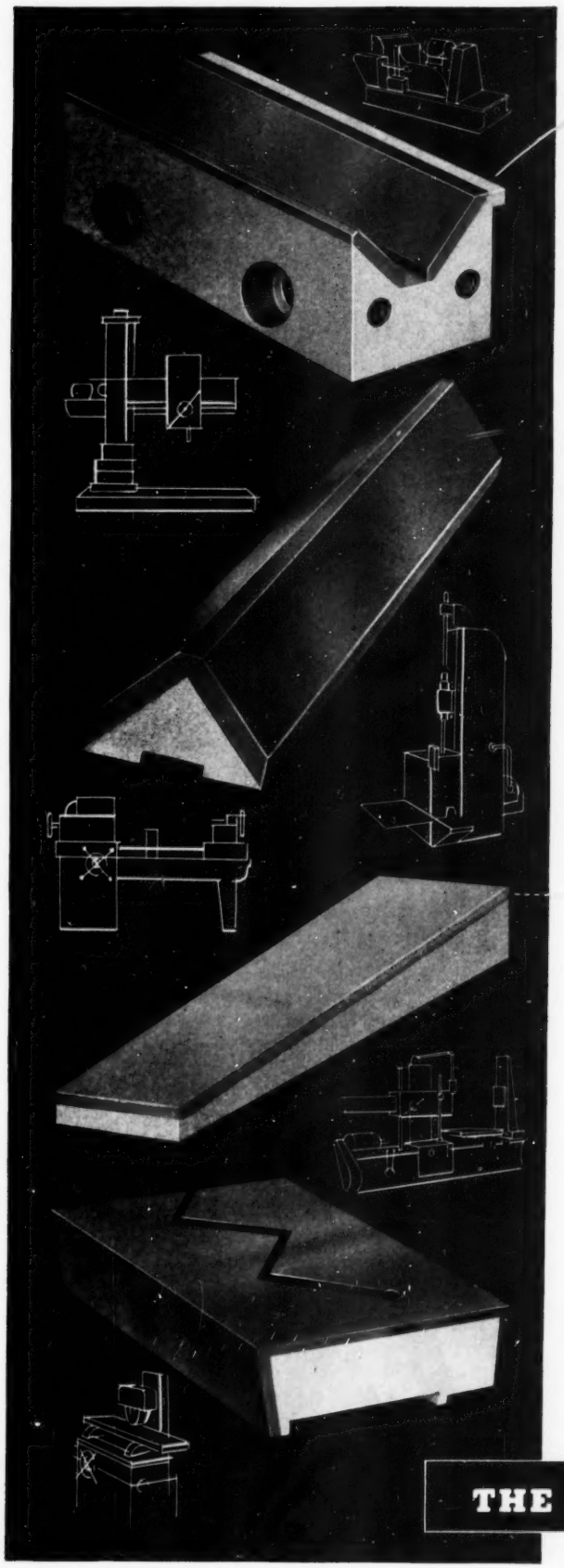
The Table and Saddle were moved in all directions under feed and power traverse with this unusual load. All movements were extremely smooth without any tendency toward sticking or overloading the main drive motor.

This is conclusive proof of the load carrying capacity and operating smoothness of the Bullard 4-Way Bed Horizontal Boring, Milling and Drilling Machine.

BULLARD

Complete information on request.

THE BULLARD COMPANY BRIDGEPORT 2, CONNECTICUT



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The ultimate success and accurate life of your machine depends to a large extent on the accuracy, and uniform high hardness of its ways, gibs, ball races or wear strips. OK parts are the finest. They are made of special tool steel welded to a backing of soft tough steel under 2500 tons pressure, then hardened to a Rockwell C-65-66 and ground to tolerances of ± .00015 (both straight and parallel). They are available in all sizes and shapes, to meet your particular requirements.

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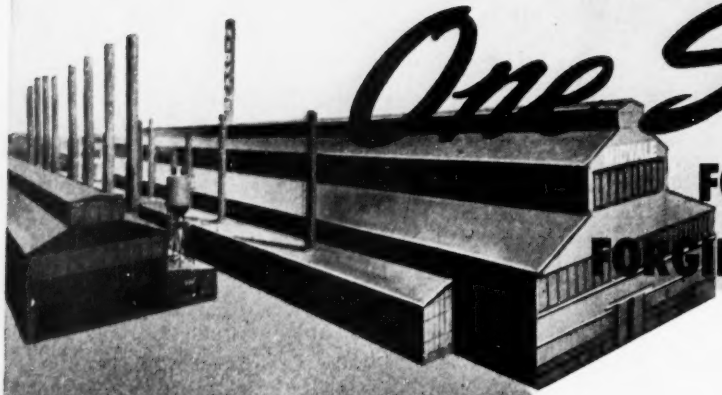

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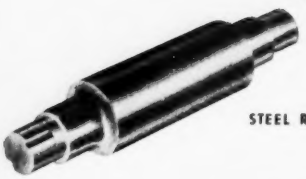
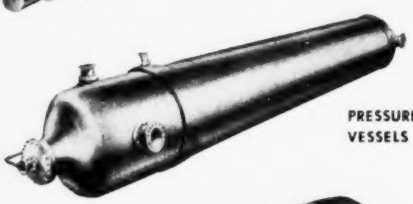


STEEL ROLLS



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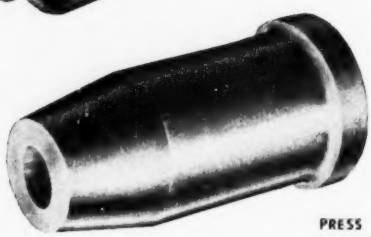

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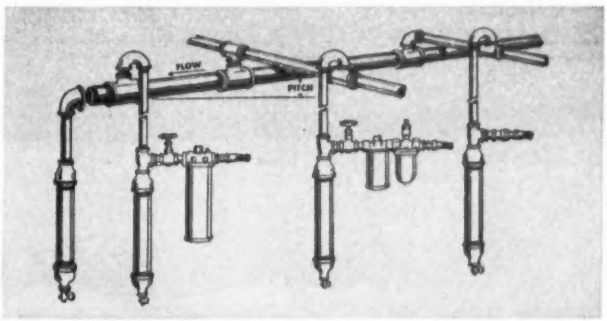

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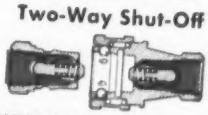

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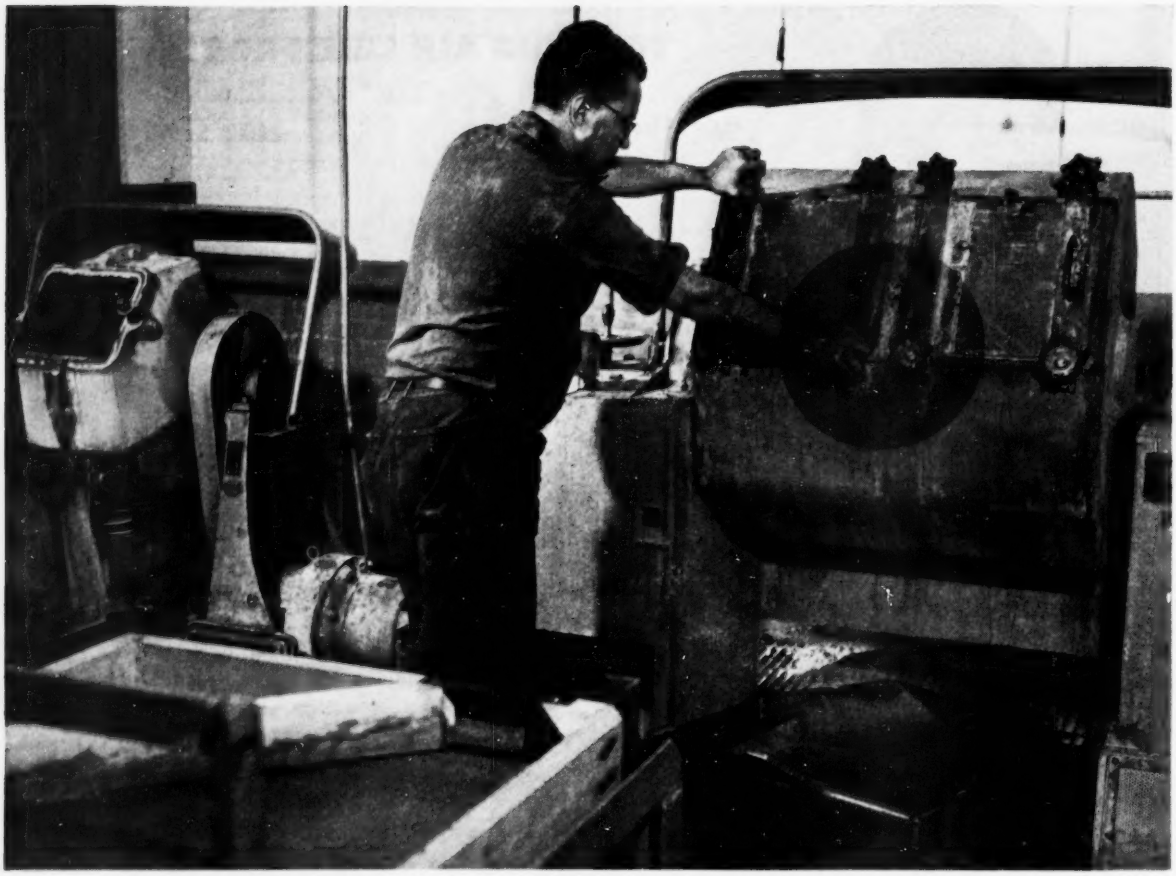

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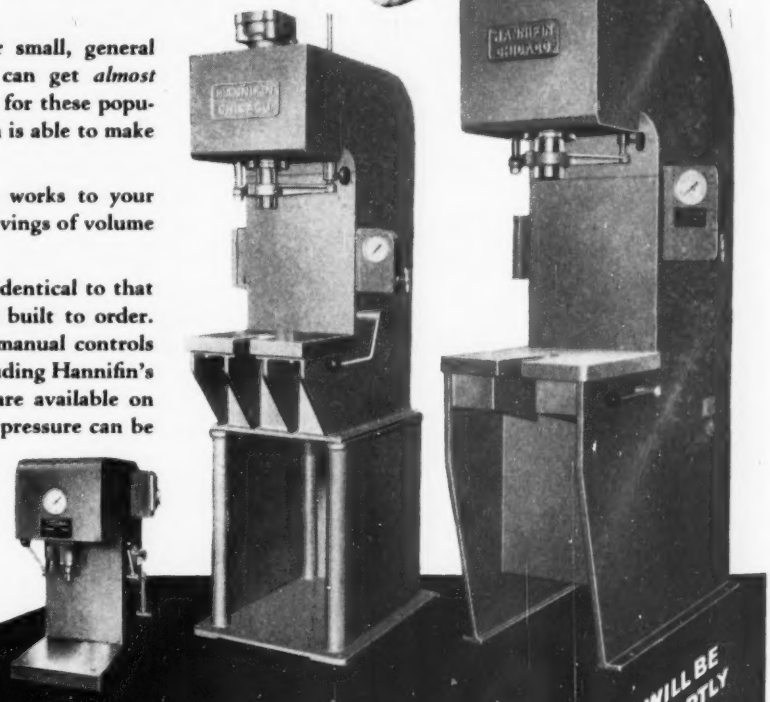

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MODEL NUMBER		F-10	F-20	F-50	F-80	F-101
RAM SPEED (in.-min.)	Down	400	190	120*	73*	130
	Up	800	345	240*	151*	254
PUMP (gpm.)		3.3	3.3	5*	5*	11
MOTOR (hp)		1½	1½	2*	2*	5
STROKE (in.)		6	6	10	10	12
GAP (in.)		10	10	16	16	22
REACH (in.)		6	6	7½	7½	10
BULLETIN		H-784	H-784	135	135	134

*Supplied with larger motor and pump when higher ram speed is required.

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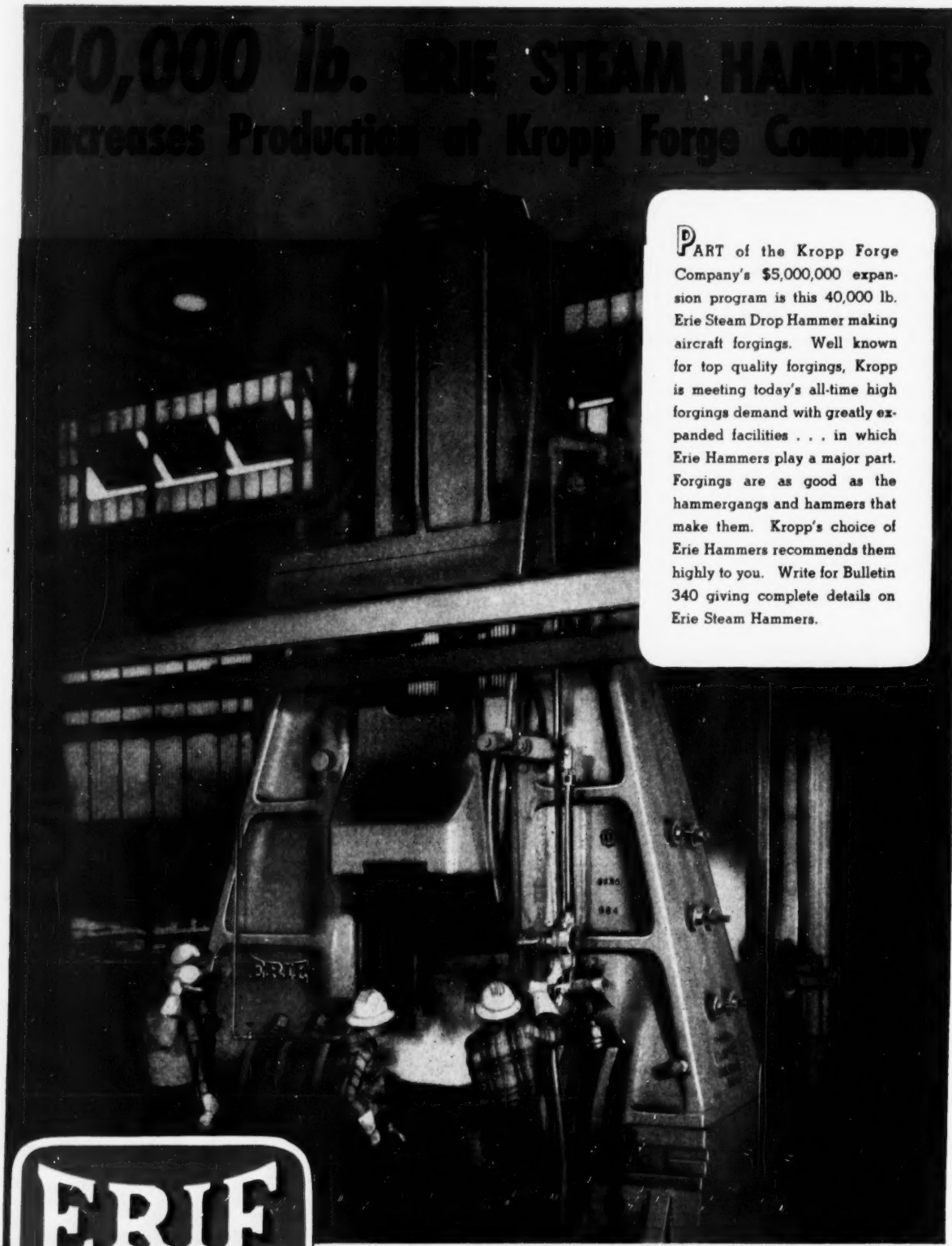
40,000 lb. ERIE STEAM HAMMER Increases Production at Kropp Forge Company



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- **STELLITE**
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—and all other metals not affected by fused caustic at 700°F.

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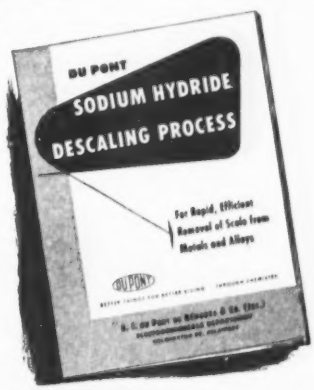

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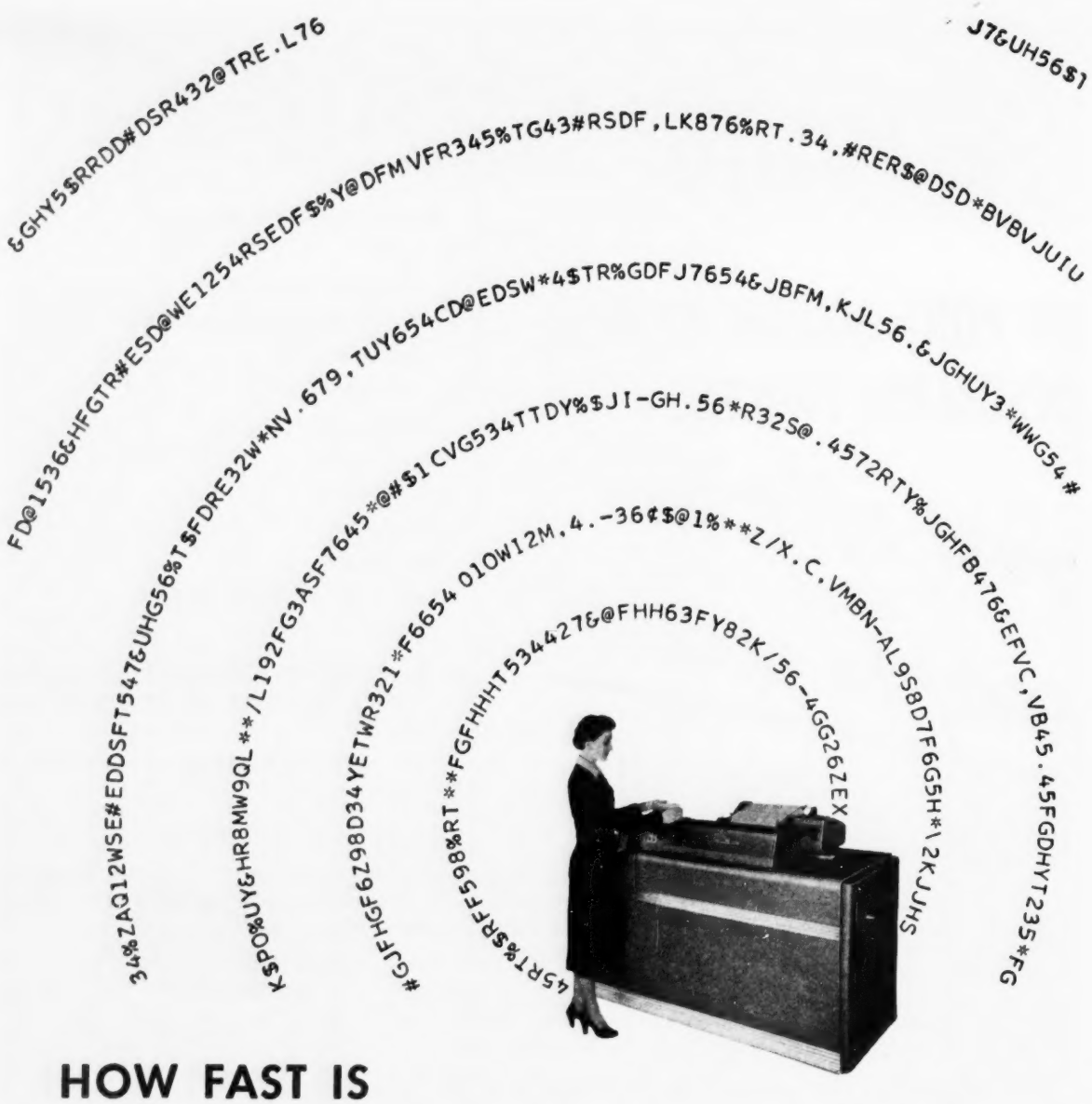

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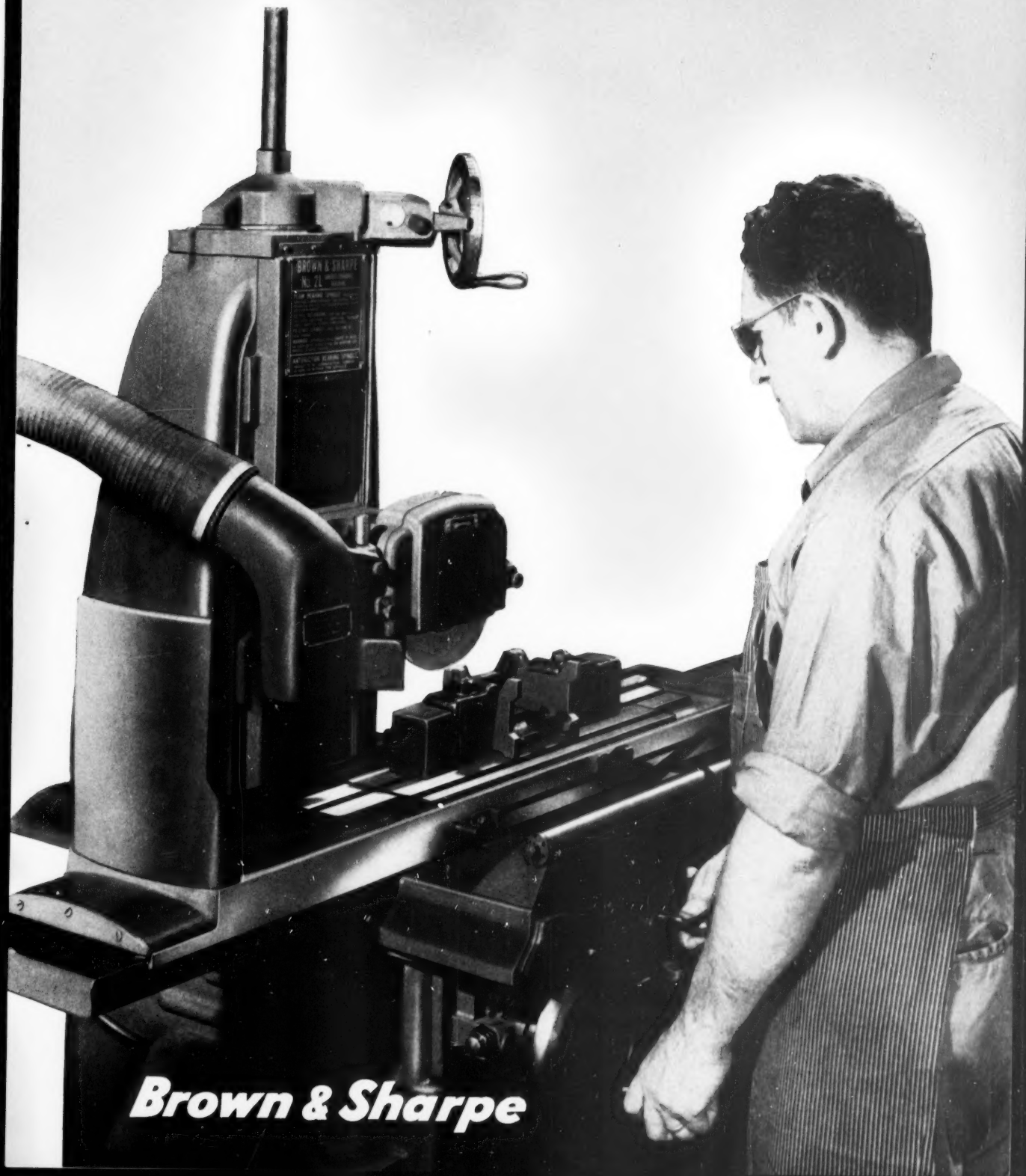

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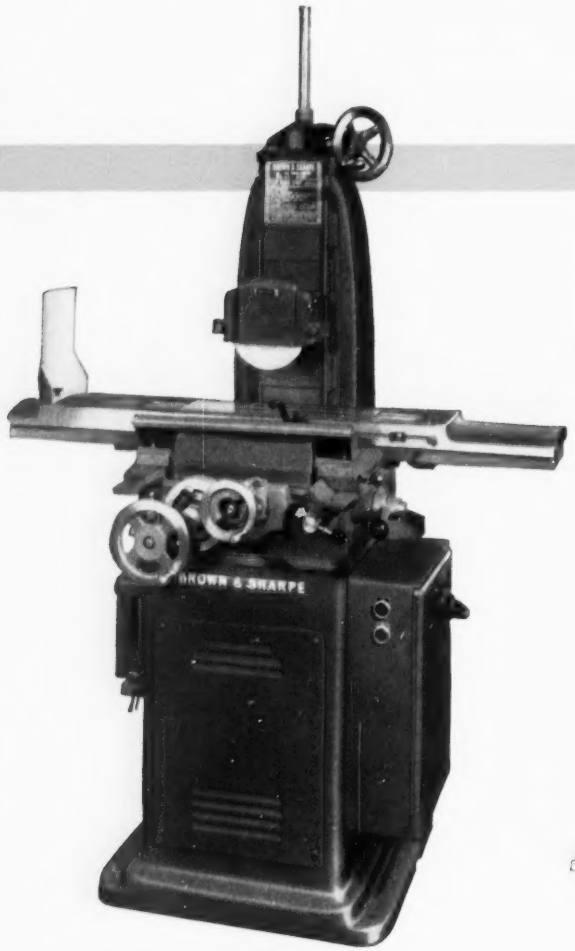

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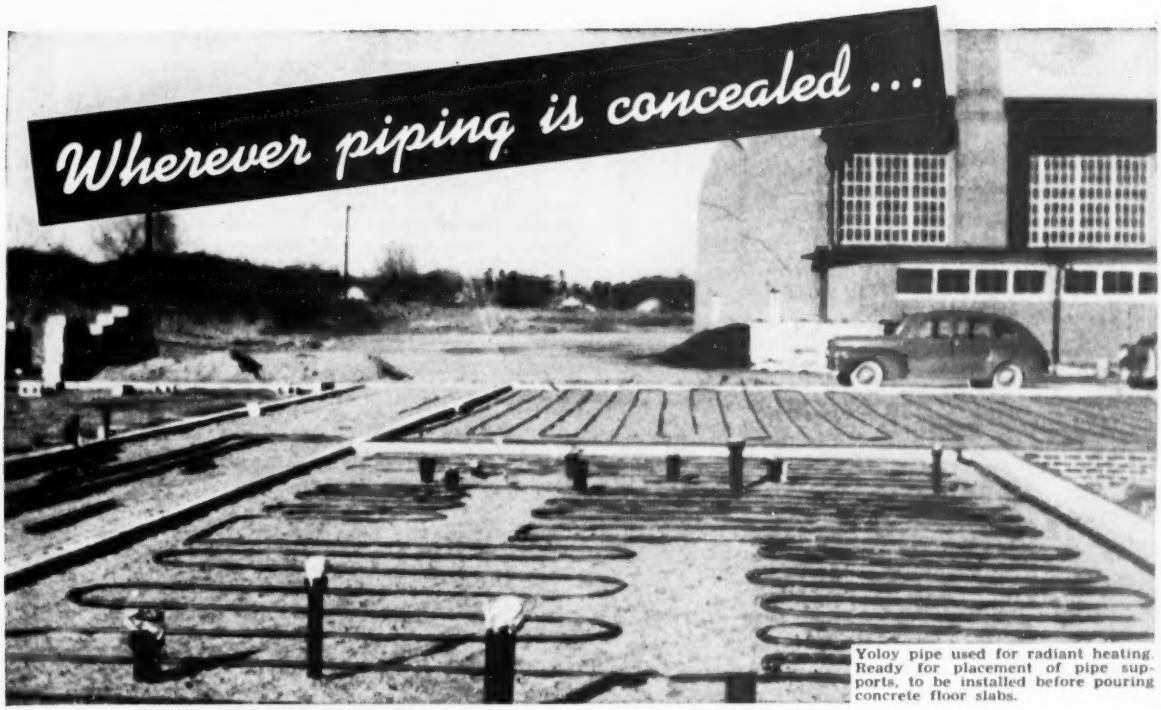

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Yoloy Continuous Weld Pipe offers distinct advantages for radiant heating and snow removal. Its use is recommended whenever piping is concealed—in industrial plants, commercial buildings, hospitals, schools and residences.

In standard tests Yoloy steel has demonstrated that its resistance to atmospheric corrosion is four to six times greater than that of regular steels. In actual installations Yoloy Pipe has demonstrated that it has a high resistance to many other corrosive conditions.

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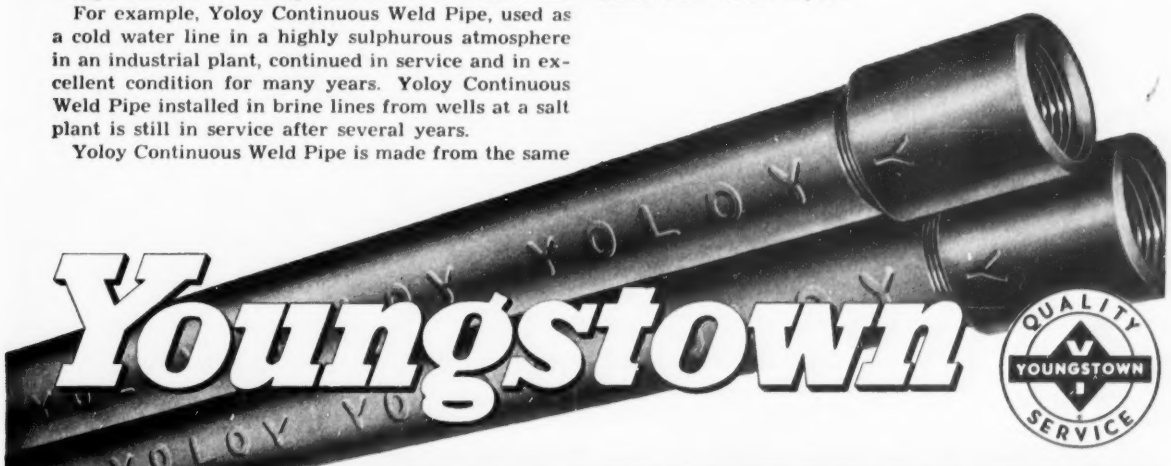
Yoloy Continuous Weld Pipe is made from the same nickel-copper steel composition that has proved so successful in service in the oil, mining, railroad, chemical, trucking and other industries where resistance to corrosion and abrasion is of prime importance. This pipe is easy to thread and fabricate with standard pipe tools. It can be electric or gas welded readily. It has high strength and high resistance to abrasion, shock and vibration fatigue. For further information, write or phone the Youngstown District Sales Office nearest you.



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...and only one knob control!
look at the size of that transformer!
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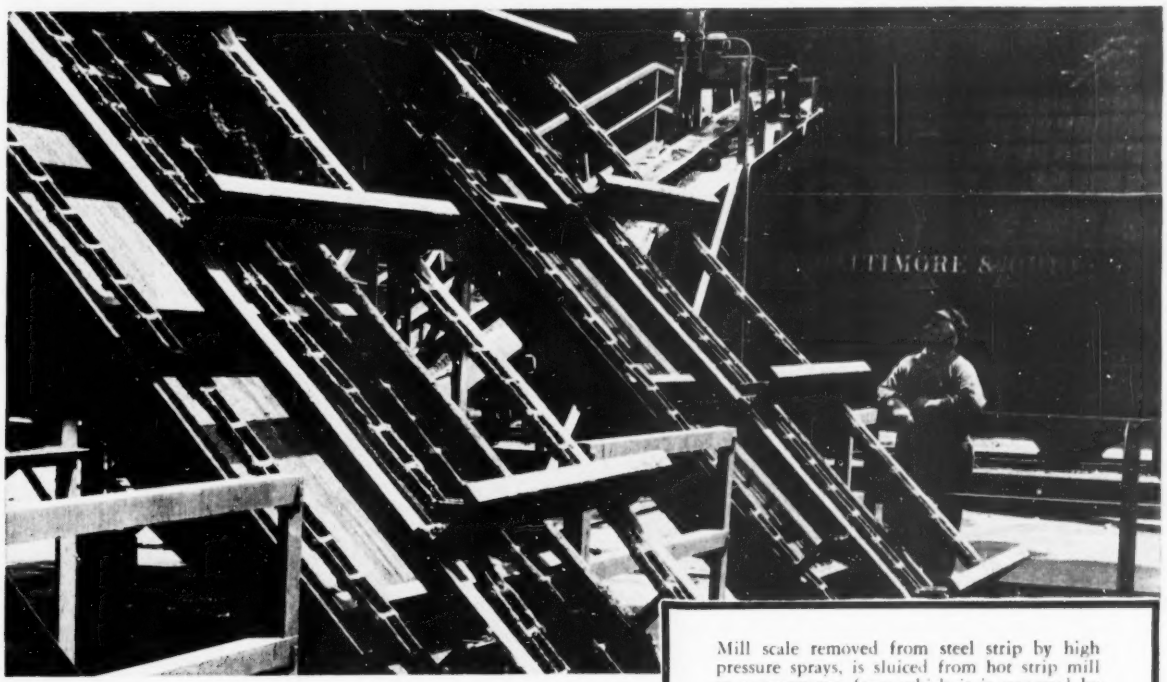
Boosts mill scale recovery from 250 to 475 tons a week



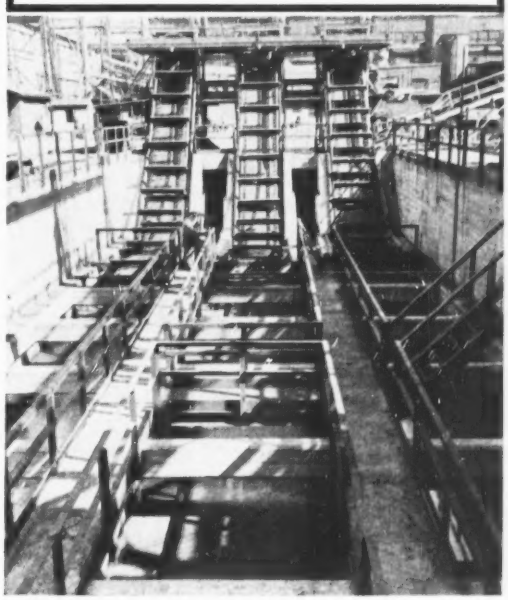
Mill scale removed from steel strip by high pressure sprays, is sluiced from hot strip mill to concentrator, from which it is removed by three Link-Belt Straightline Collectors. Two Link-Belt belt conveyors—a horizontal collecting belt and an inclined pivoted loader—then carry scale to railroad cars. After fusing by sintering, the recovered scale is charged into blast furnace.

Steel mill also eliminates clogged sewers with LINK-BELT Straightline Collectors

HERE'S the case of a mill that saw its profits literally "going down the drain"—and did something about it. Before installing Link-Belt Straightline Collectors, almost half the scale passed into the sewers, causing frequent clogging.

Now, with their new collectors, they've boosted recovery from 250 to 475 tons a week. Since the scale is 72% pure iron, each ton is equivalent to 1½ tons of ore. And the waste water is actually clearer than the river water . . . aiding the anti-river-pollution program.

No matter what your waste treatment problem, you'll find it pays to call in a Link-Belt engineer. Drawing on Link-Belt's broad experience in this highly specialized field, he can recommend the equipment best suited to your requirements from the complete Link-Belt line. Ask your Link-Belt office for further information.



LINK-BELT

CONVEYING AND HANDLING EQUIPMENT

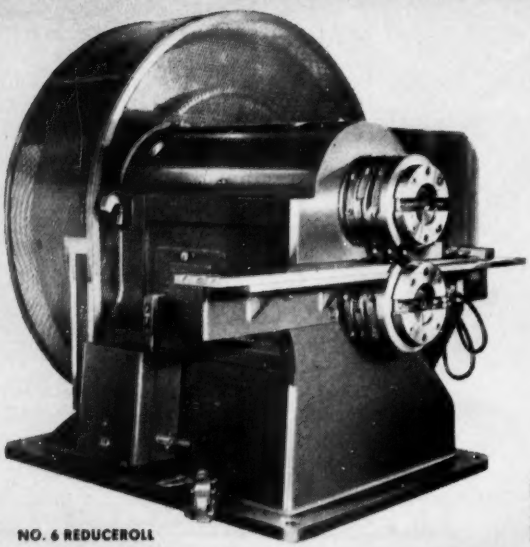
LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices in Principal Cities. 13.064

REDUCEROLLING THIS BELL CRANK FORGING BLANK—

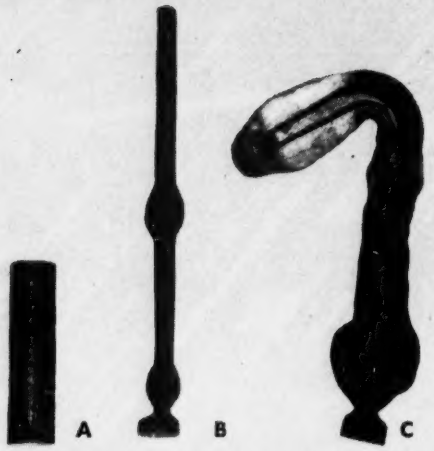
1. Cuts labor cost in half . . .

2. Doubles production per man hour . . .

3. Saves one pound of steel per forging!



NO. 6 REDUCEROLL



Stock (A) measures 2¼" round by 8¾" long, weighs 10 lbs. REDUCEROLLED blank (B) ready for forging. Finished forging (C). Note small amount of flash.

METHOD	EQUIPMENT	CREW	FORGINGS PER 8 HOURS
OLD	Two Hammers	4 Men	575
NEW	One Hammer One Reduceroll	3 Men	900
RESULTS	Saves One Hammer	Saves One Man	Produces 325 More Forgings

From one of America's largest and most modern forge shops comes this report of outstanding progress in forging the steering bell crank illustrated above.

The REDUCEROLLING technique, in addition to producing 325 more forgings per eight hours, also obtains three extra forgings from each bar of stock, thus saving one pound of steel per forging. Rolls were redressed after pre-forming approximately 14,000 blanks. Same rolls have been redressed three times to date.

THIS DOOR IS ALWAYS OPEN!

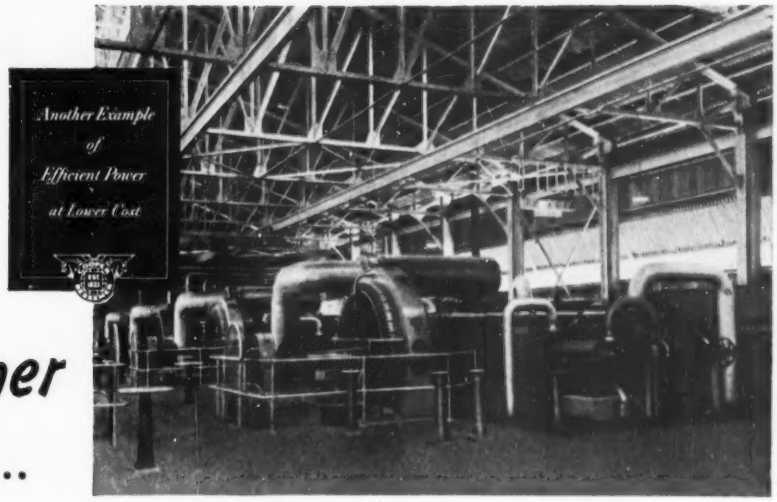
Our entire organization is always at your service to help you solve your forging problems. Send us prints or samples of the parts you wish to forge. Better yet, visit us. No obligation, of course.

NATIONAL MACHINERY COMPANY

TIFFIN, OHIO—SINCE 1874

DESIGNERS AND BUILDERS OF MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS • BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS

Hartford Detroit Chicago



Cooper-Bessemer

MODERN DESIGN...

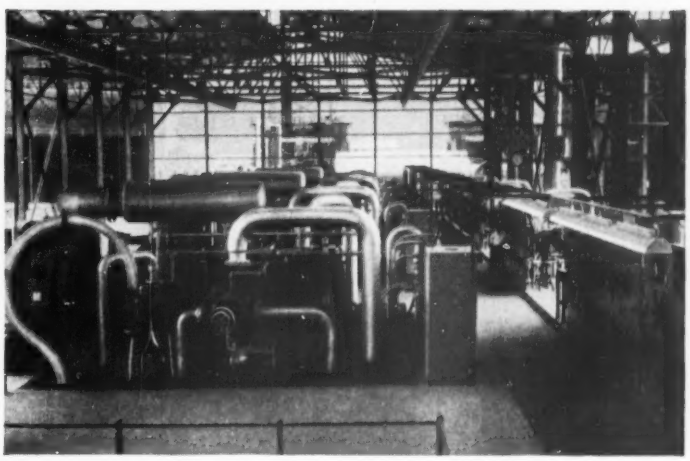
for compressors at Sindri . . . at Suez . . . everywhere!

● Shown opposite are Cooper-Bessemer motor-driven compressors in two of the world's newest and largest synthetic ammonia plants.

The top view shows part of the 22,000 Cooper-Bessemer M-Line compressor horsepower installed in the ammonia synthesis plant of the Sindri Fertilizer Factory, Bihar Province, India. Here, ammonium sulphate can be produced at a rate of 1,000 tons a day — 350,000 tons a year!

Similarly the other photo shows a line-up of Cooper-Bessemer compressors in the large Suez plant of the Societe Egyptienne D'Engrais et D'Industries (S.A.E.), Egypt. Here, calcium nitrate fertilizer is produced at a rate of 200,000 tons yearly.

In both plants, these modern Cooper-Bessemer units handle the entire compressing job and comprise the heart of production operations. For, with Cooper-Bessemers, you can be sure of year-in, year-out performance at the lowest operating cost.



Cooper-Bessemer M-Line motor-driven compressor in the synthesis section of the Sindri Fertilizer Factory, India. Here eight 2,750 hp 7-cylinder units compress gas through six stages to a pressure of 5,500 psi. The huge Sindri plant was engineered by the Chemical Construction Corp., New York, and built under the direction and supervision of the Power-Gas Corp., Ltd., England.

Here, in the Suez plant of the Societe Egyptienne D'Engrais et D'Industries (S.A.E.), these four 2,750 hp JM-5 motor-driven units compress 25,344 mcf of gas daily from atmospheric to 5,200 psi for initial calcium nitrate production of 200,000 tons yearly. This plant, engineered by the Chemical Construction Corp., utilizes waste gases from nearby oil refineries.

The Cooper-Bessemer Corporation

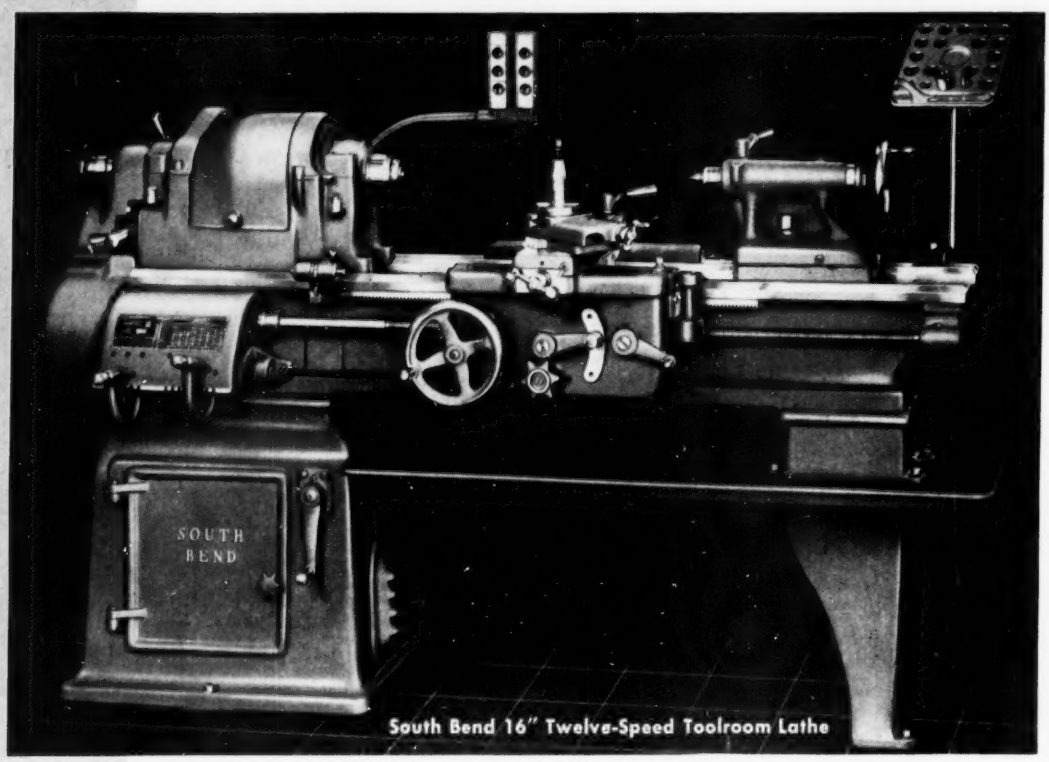
MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York Washington, D. C. Bradford, Pa. San Francisco Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle Tulsa Shreveport St. Louis Los Angeles Chicago Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia Gloucester, Mass. New Orleans, La.

Cuts Machining Time

SOUTH BEND 12 SPEED LATHE

The wide range of spindle speeds on this new lathe cuts machining time because the operator quickly selects the right speed for each operation. Pushbutton control provides a fast change from any high speed to the corresponding low speed. This versatility is further increased by 48 choices of longitudinal and cross feeds which insure maximum efficiency on every job. Also, you will find that its accuracy and ease of operation make your tough jobs easy. Send the coupon for complete information.



South Bend 16" Twelve-Speed Toolroom Lathe

SPECIFICATIONS

Spindle Speeds — 12. Direct drive: high range 300, 550, 945; low range 150, 278, 475. Back gear drive: high range 32, 70, 118; low range 20, 33, 60.

Spindle Bore — 1⅜".

Swing over bed and saddle wings — 16¼".

Swing over saddle cross slide — 9⅜".

Distance between centers — 33¼", 45¼", 57¼", 81¼", 105¼".

Collet Capacity — 1" maximum.

Longitudinal Feeds — 48 R.H. or L.H., .0015" to .0841".

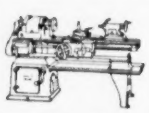
Cross Feeds — 48, .0006" to .0315".

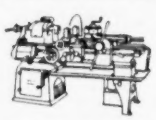
Thread Pitches — 48, 4 to 224 per inch.

SEND INFORMATION CHECKED:

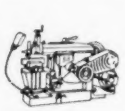
☐ _____

☐ TOOLS & ATTACHMENTS


☐ 9" and 10" BENCH LATHES


☐ 10" to 16-24" FLOOR LATHES

☐ ½" and 1" Collet TURRET LATHES


☐ 14" DRILL PRESSES

☐ 7" BENCH SHAPERS

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Building Better Tools Since 1906 • **SOUTH BEND LATHE** • South Bend 22, Indiana

HEAVY STRUCTURALS

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CENTRAL STEEL
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No order too small to receive prompt, careful attention

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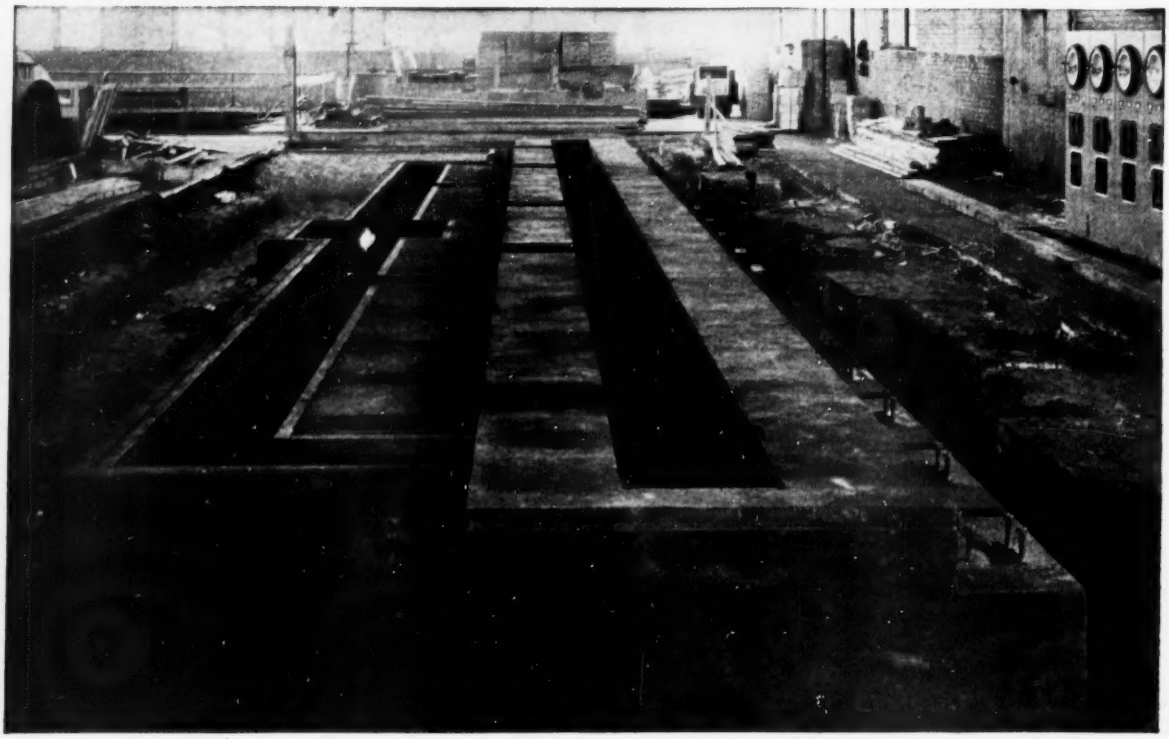
6623 W. Mitchell St.
EVergreen 4-7400

Here's where LUMNITE Concrete*

SAVED TWO WEEKS' WORK



Built to take the soaking heat of a continuous heat-treating furnace, this Heat-Resistant Concrete foundation was placed in 9 hours. Lumnite cement was used with pre-soaked Lelite aggregates.

POURED MONDAY... READY TUESDAY—That's the short, profitable story of this Heat-Resistant Concrete flue and foundation for a Wire Patent Furnace at John A. Roebling's Sons, Roebling, N. J. Their superintendent reports substantial savings on the job. And small wonder. It is estimated that by conventional methods this job would have taken about 2 weeks more to complete!

SIMPLE MONOLITHIC CONSTRUCTION is *naturally* faster than laying up thousands of small units. And Lumnite Concrete reaches service strength in 24 hours or less. That cuts outage time on both Heat-Resistant and Refractory jobs. Moreover, upkeep costs are low because Lumnite Concrete withstands severe thermal shock, resists corrosion and abrasion, and, with suitable aggregates, takes heat to 2600°F.

WHETHER YOU NEED Heat-Resistant, Refractory or Insulating Concrete, you can make it quickly, easily and economically with Lumnite calcium-aluminate cement and the proper aggregates. It has a proved time- and cost-saving record for flues and furnace foundations, and for door linings, car tops, base pads, foundry floors, stack linings and many other installations.

FOR CONVENIENCE you may prefer to buy prepared Castable mixes. These packaged mixtures of Lumnite and selected aggregates are tailor-made to meet your specific temperature and *insulation* requirements. Add only water. They're made by refractory manufacturers and sold through their dealers. For more information write: Lumnite Division, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Ave., New York 17, N. Y.

*"LUMNITE" is the registered trade mark of the calcium-aluminate cement manufactured by Universal Atlas Cement Company.

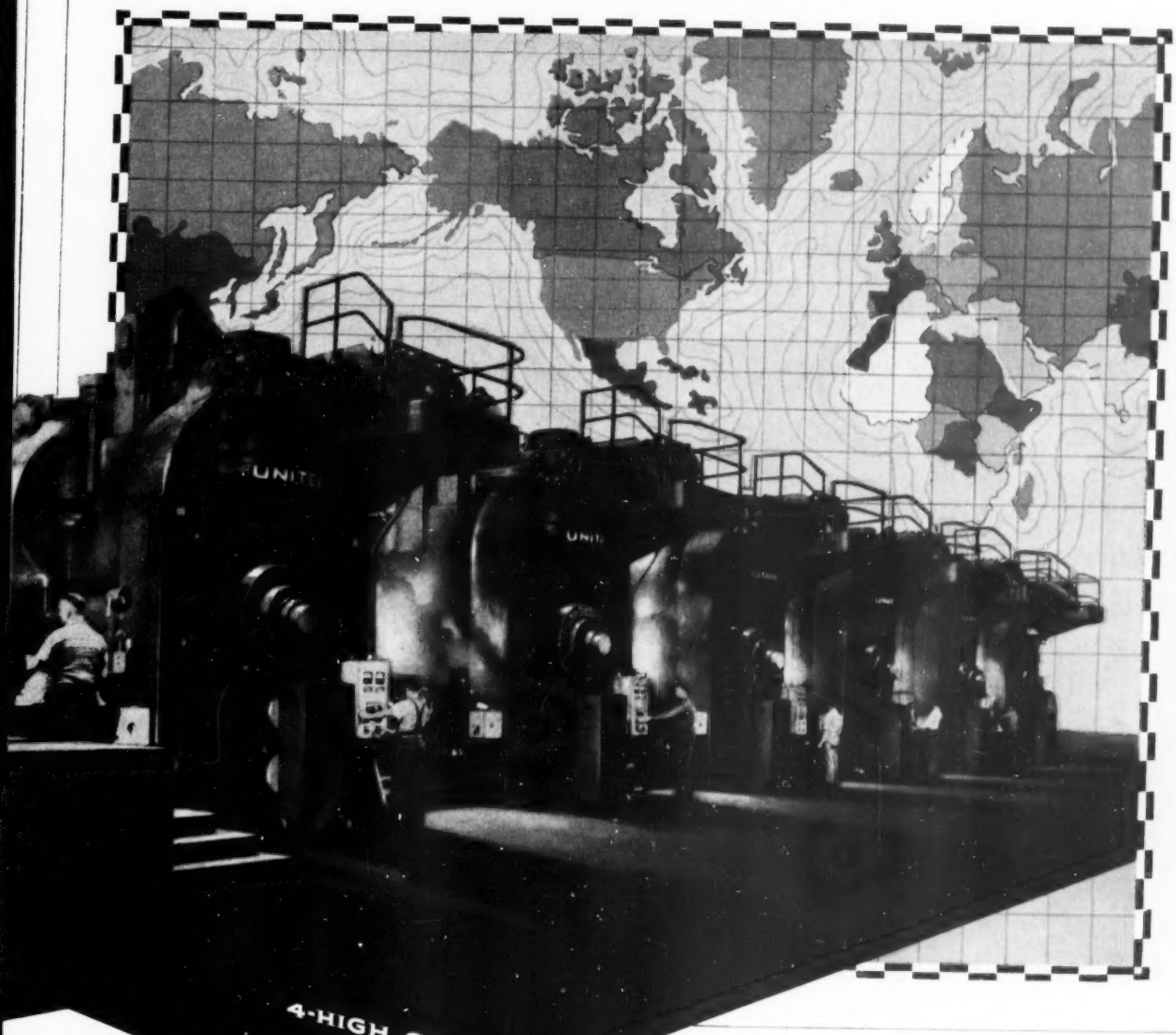
S-L-60-R

ATLAS® **LUMNITE for INDUSTRIAL CONCRETES**

REFRACTORY, INSULATING, OVERNIGHT, CORROSION-RESISTANT

A UNIVERSAL ATLAS PRODUCT

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*



4-HIGH 6-STAND CONTINUOUS HOT STRIP MILL

(OPERATING IN WALES)

DESIGNED AND BUILT BY

UNITED

ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at PITTSBURGH • VANDERGRIFT • NEW CASTLE • YOUNGSTOWN • CANTON

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO • LOBDELL UNITED COMPANY, WILMINGTON, DELAWARE • STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

UNITED can serve you no matter where in the world you are.

How a Monel Pickling Chain made a comeback

...after 6 years in a hot Sulphuric Bath!

At Youngstown Welding & Engineering Co., new Monel links are welded into this Monel chain which had been attacked at the acid level after six years in hot sulphuric pickling bath. Reconditioning Monel pickling equipment after years of service saves in replacement costs.

Corrosion attacks pickling equipment viciously at the acid level – the zone where acid meets air.

So the owners of a wrought Monel® chain learned... when after six years of service they found the links at this point were gradually being destroyed. As the rest of the chain was in good condition they decided to have it reconditioned and the weak section replaced. At the Youngstown Welding & Engineering Company where the corroded section was cut out, new links of Monel were welded in with an oxy-acetylene torch.

Now the chain is back, ready for many more years of service.

Pickling chain is only one example of where Monel equipment fabricated by Youngstown Welding & Engineering Co. can give extra-long service life... and can then be reconditioned for additional years of use.

Strong, corrosion-resisting Monel can help you obtain substantial savings in replacement and maintenance costs in all types of pickling equipment... crates, hooks, tie-rods, racks. And because Monel is so strong, you can have lighter equipment which means increased payloads.

"Where Monel Pays Its Way in PICKLING," has been specially prepared to show you how useful Monel can be. Why don't you write for your free copy, now?

Be sure to consult your Distributor of Inco Nickel Alloys for the latest information on availabilities from warehouse and mill. Remember, too – it always helps to anticipate your requirements well in advance.

Here's how the chain section at the acid level looked after six years of service. These original links were flash welded. Replacement links are formed from Monel rod and gas welded.

Here's how the chain looked after the corroded links had been cut out and new Monel links were welded in by oxy-acetylene torch. Now it is ready for many more years of rugged duty.

INCO TRADE MARK

Monel PICKLING EQUIPMENT

extra life
extra capacity
extra safety

The International Nickel Company, Inc.
67 Wall Street, New York 5, N. Y.

The Metalworking Outlook

April 6, 1953

Production: Highest Ever

Even if the Korean War were to end tomorrow, industrial production would remain at or near peak levels for at least the next four to six months. Even if activity by the end of the year drops 15 or 20 per cent from today's levels, the economy would be running at one of the best peacetime clips in history. Current output rates are terrific. The Federal Reserve Board's estimated March industrial index is at the postwar high of 241 per cent of the 1935-1939 average, compared with 239 per cent in February and 218 in February, 1952.

Will 1953 Be Best in History?

Producers of transportation equipment expect sales to be 32 per cent higher than last year, according to a Commerce department survey. Automakers foresee 18 per cent better sales, and electrical machinery producers predict a 14 per cent improvement. For most industries, realization of those expectations will result in the highest sales volume on record. Every major industry in the survey expects higher sales volume in 1953 than in 1952.

Tax Cuts More Likely

President Eisenhower is in danger of suffering a major political defeat, a slap in the face administered by members of his own party. As it looks now, a tax reduction program that will mean $8.5 billion a year less in federal revenues will be bulled through the House, despite the opposition of the administration. Senators will not be so anxious for tax reductions, but even in the upper chamber the sentiment toward tax-cutting is making headway. Major proposed cuts: No excess profits tax after June when it is now scheduled to expire; expiration of the 11 per cent increase in personal income taxes June 30 instead of Dec. 31; lower excises after April, 1954. Commerce, Justice, Agriculture and Labor departments thus far have come up with budget cuts that total only $417 million.

Mr. Durkin Doing Well

Watch Labor Secretary Martin Durkin. He's making a good impression. Mr. Durkin is working closely with the Commerce department, so the business viewpoint will have a chance to be heard in government labor policies. What's more, the secretary has abandoned the tripartite committee of labor, business and public members as an unworkable device and has indicated that he will let Congress decide on any amendments to Taft-Hartley.

Work Stoppages Drop

You can expect 1953 to be a far quieter year regarding strikes than 1952 was. True, we will have walkouts all year long, but nothing comparable to the steel strike of 1952 appears likely. Already, the work stoppage record is much better this year than last. Idleness resulting directly from walkouts amounted to about 1 million man-

Production Engineering News—p. 101 *The Market Outlook—p. 163*

days in February, compared with 1,250,000 in January and 1,370,000 in February, 1952.

Progress on the Seaway

The odds are good that the U.S. will finally participate in the St. Lawrence Seaway. The administration favors it, but will hold off on specific recommendations until after the Senate Foreign Relations Committee holds its hearings, which begin Apr. 14.

Gradual Shift for the FTC

The Federal Trade Commission will gradually shift its antitrust position to one more favorable to business. The new chairman, Edward F. Howrey, a Virginia Republican, is no New Dealer. He and Lowell Mason, the lone dissenter until now against the rigid antitrust views of the FTC majority, will unite to try to swing opinion gradually to more moderation.

Expansions in Pig Iron

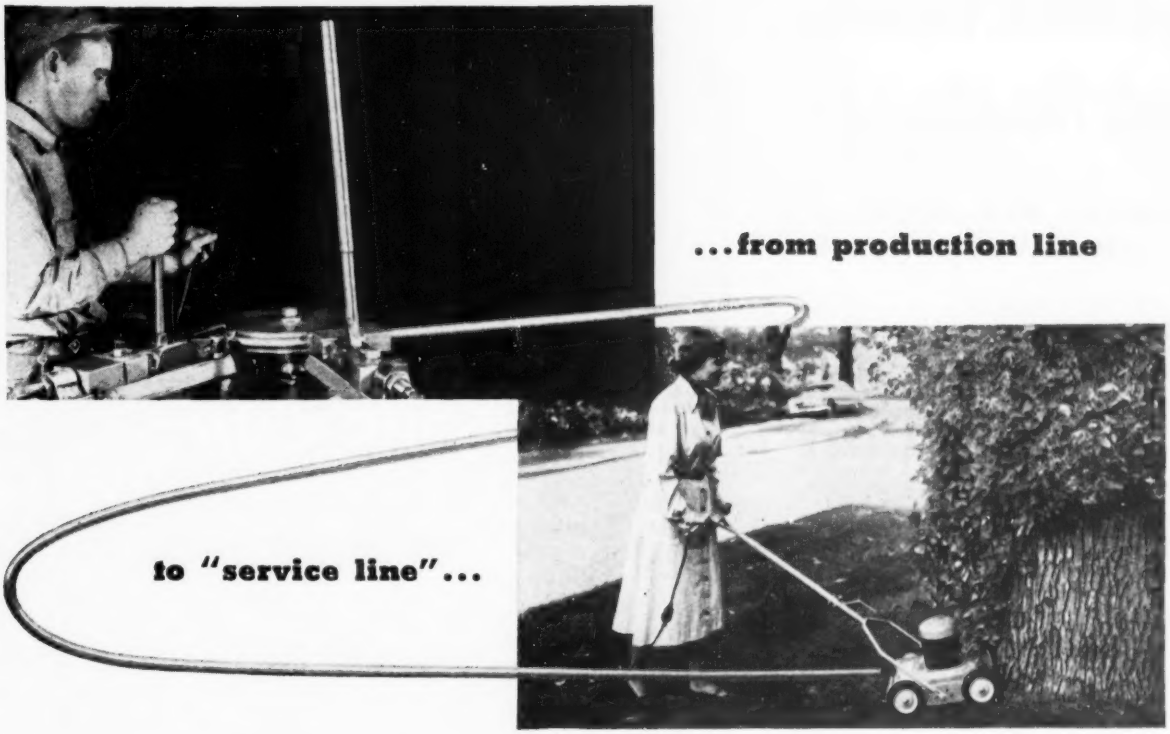
Washington corridor talk has it that Jackson Iron & Steel Co., Jackson, O., wants approval for a new blast furnace with merchant pig iron capacity of 240,000 tons annually. Also, Great Lakes Steel Corp., Detroit, is reportedly seeking an o.k. to rebuild its A Furnace and double its capacity to 486,000 tons yearly.

Straws in the Wind

The administration is working out details for a plan to provide small business loans of not more than $100,000 after the RFC goes out of existence . . . SJ Res 61 proposes a constitutional amendment limiting federal nonmilitary spending to 5 per cent of the national income, with certain carefully defined exceptions requiring a two-thirds vote of Congress . . . Ford Motor Co. open hearths established a new record in March of 134,006 tons, compared with the previous high of 124,149 tons reached in March, 1952 . . . Westinghouse Electric Corp. employment is now at a peak of 121,000 and still rising.

What Industry Is Doing

Inventories and deliveries of components are improving rapidly, but are still causing trouble, according to a STEEL quarterly survey (p. 59) . . . Kaiser Steel Corp., Fontana, Calif., expects to blow in its third blast furnace about May 15 (p. 60) . . . Railroads are dickering to get their temporary hikes in freight rates made permanent (p. 61) . . . Manufacturers of containers and packaging materials are looking forward to good sales throughout 1953 (p. 61) . . . Magnesium producers reveal new uses for the light metal at an exhibition in Washington (p. 62) . . . Interest is reviving plans for selling company shares to workers (p. 63) . . . Bicycle makers rolled out 2 million vehicles in 1952 and expect to do even better in 1953 (p. 70) . . . Competition is taut in the wire rope industry as the sales outlook darkens (p. 71).



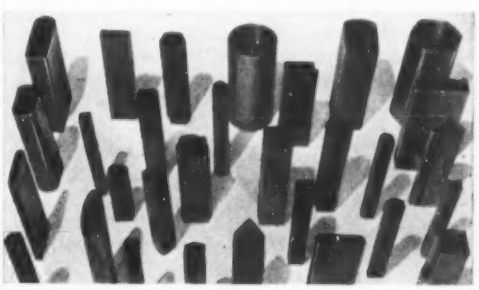
Armco Steel Tubing moves your products faster

To cut your shop costs . . . to give your products that extra "sales" appeal, look into Armco Welded Steel Tubing.

Used in place of angles and other solid sections, Armco Tubing simplifies design and speeds production. And its smooth surface makes your products more modern and attractive — more salable.

Tubular parts mean your products are stronger and lighter in service, too. Loaded as a beam, Armco Welded Tubing has less than one-fifth the deflection with the same amount of steel. And as a column, it offers more than five times the load-carrying capacity with the same amount of steel.

Armco Welded Steel Tubing comes in a variety of made-to-order shapes in Hot-Rolled or Cold-Rolled Steel; in ALUMINIZED (an aluminum-coated steel) and in ZINCGRIP (a specially zinc-coated steel). Our Tubing Specialists will help you select the *right kind* of tubing for your products. Write for further information.



These are some of the standard and special shapes of Armco Welded Steel Tubing. With either standard or special shapes, you can reduce fabrication time and costs, give your products a more substantial look.

ARMCO STEEL CORPORATION

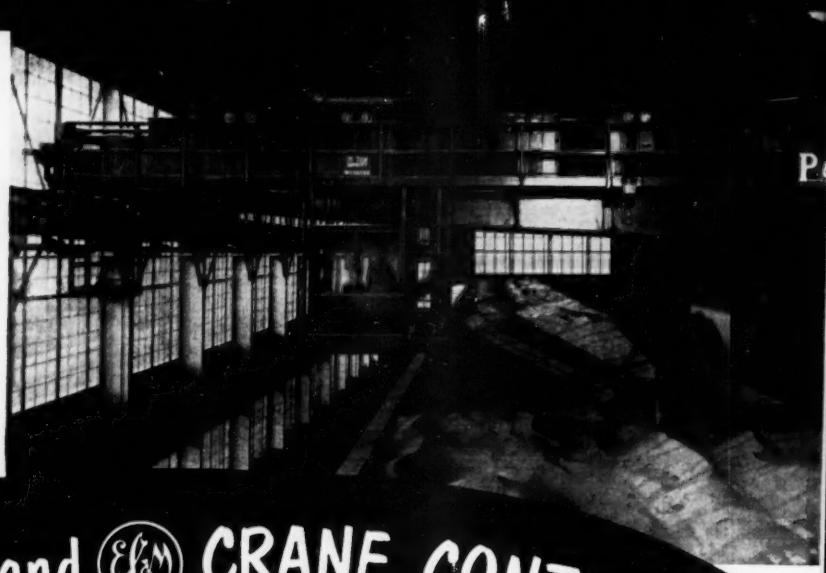
MIDDLETOWN, OHIO, WITH PLANTS AND SALES OFFICES FROM COAST TO COAST
THE ARMCO INTERNATIONAL CORPORATION, WORLD-WIDE

ARMCO

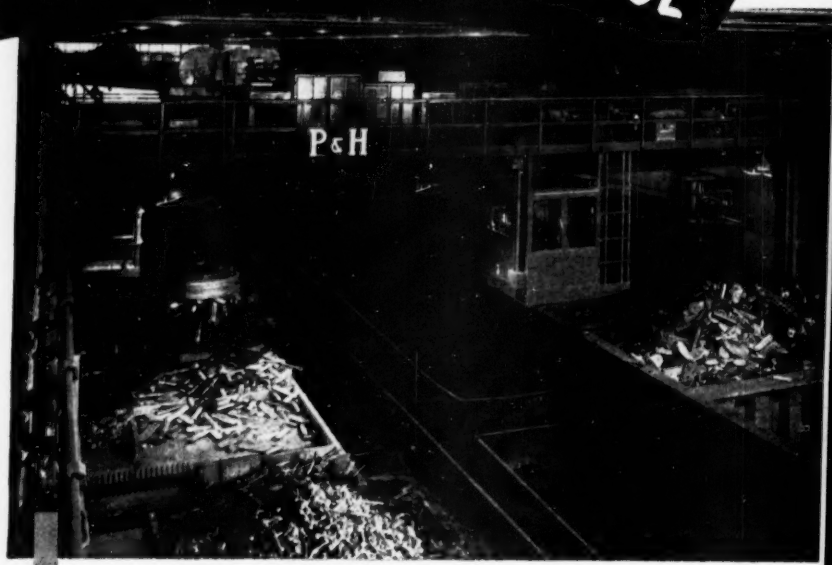
New, FORD Foundry Speeds Handling of—

SAND, PIG IRON, SCRAP, SLUDGE

with



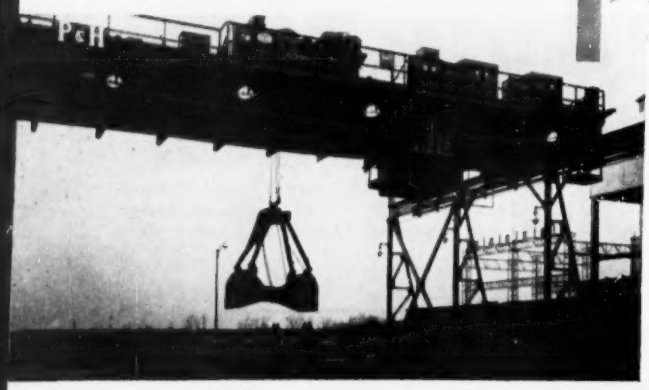
EC&M MAGNETS and EC&M CRANE CONTROL

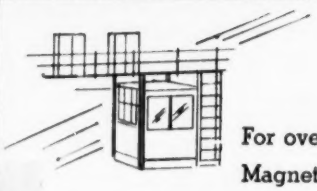


THESE CRANES AT THE NEW, MODERN FORD FOUNDRY IN CLEVELAND ARE EQUIPPED FOR —

1. *Speed Control* with EC&M Cam Type Master Switches—Bulletin 1190.
2. *Smooth Starts and Stops* by EC&M Frequency Relay Controllers—Bulletin 930.
3. *Long-life Brake Operation* through EC&M Type WB Brakes —Bulletin 1006.
4. *Safety* with EC&M Manual-Magnetic Disconnect Switch—Bulletin 1024.

Also on the magnet cranes, EC&M Bulletin 900 ALL-WELDED Lifting Magnets and EC&M Bulletin 905 Automatic-Discharge Controllers speed scrap and pig iron handling at low cost.





For overhead foundry cranes, EC&M Magnets and EC&M Crane Control have earned a reputation for fast, safe handling of materials in all stages of production. Designed for highly repetitive operation, EC&M equipment gives "main-line, non-stop" service which, users know, results in quicker handling and lower cost per operation. When buying cranes, make it a point to specify EC&M Control and EC&M Magnets.

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Let's Have All the Facts

Technologists in the metalworking industry will not be satisfied with the explanations thus far offered by Secretary of Commerce Sinclair Weeks on the controversy which caused Dr. Allen V. Astin to resign as director of the National Bureau of Standards.

Apparently an important factor in Secretary Weeks' decision to request Dr. Astin's resignation was the manner in which the bureau handled the investigation of an additive for storage batteries called AD-X2. The secretary says that this AD-X2 matter is "one of many phases . . . . that caused us to decide it would be well to have a change in the administration of the bureau."

As yet, the other "phases" have not been divulged, but a clue to them is found in the secretary's testimony before the Senate Small Business Committee. He criticized the bureau for not being "sufficiently objective." He also voiced dissatisfaction with the bureau's lack of "awareness of the business point of view."

He testified that "the files show that scientists in the National Bureau of Standards were in touch with and worked closely with individuals and organizations who might have had an interest in the final outcome, submitting their work to them previous to publication and seeking their advice and guidance." This indicates that the secretary believes the bureau's scientific findings were influenced by ulterior and perhaps sinister motives. Also, his testimony hints strongly that the bureau has been discriminating against "little businesses."

These are serious charges. They are particularly shocking because the National Bureau of Standards has enjoyed a reputation of high integrity in scientific matters over a long period of time. One cannot recall any important instance in which the bureau has permitted political or other ulterior influence to interfere with its scientific objectivity.

Now that Secretary Weeks has raised doubts about the integrity of one of his important bureaus, it becomes absolutely necessary that every detail be aired thoroughly. If his charges can be substantiated, then the faults must be corrected promptly. If he has been in error, he should admit it. In any event, the good name of the bureau must be restored at the earliest possible moment.

E. C. Shaner

EDITOR-IN-CHIEF

NO SUDDEN CHANGE DUE: It will be imprudent to dismiss the recent conciliatory guestures of the Reds lightly. The offer of the Chinese to talk about exchange of prisoners, the invitation by the Soviets to France and the United States to join England in discussing methods of avoiding airplane clashes and other incidents show that the Kremlin is in a bargaining mood.

Probably Malenkov will demand a high price

for every concession his side grants, yet there is hope that the Korean truce talks can be reopened. Should they lead to an end of hostilities, the United States will be faced with the test of making its economy click without the stimulus of a war that is actually in progress. There might be a chance to "stretch out" defense and to readjust the emphasis of our objectives. However, it is not likely that any sudden or drastic change will come from the new Red tactics.

* * *

BUSINESS IS BOOMING: At the moment, industrial production is running slightly under the peak established during the most hectic period of World War II. Contributing to this new postwar record are heavy steel output, automobile assemblies at the highest level in two years, and electric power demand (p. 77) that is running almost 10 per cent ahead of that of a year ago. Sales of some household appliances also are up as much as 27 or 28 per cent over those of the corresponding period of 1952. Machine tool builders are finding that civilian demand is increasing as orders for defense decline.

Offsets to these gratifying trends are the continued lag in revenue freight car loadings—off 4 per cent from last year, a rather serious depression in the soft coal industry, and a slackening of new orders in structural steel, foundry equipment and some other items.

* * *

FIGHTING CORROSION: Combatting corrosion is one of the most baffling problems confronting the metalworking industry. It has been estimated that in the United States (p. 102) about $6 billion is spent annually in the war against rust. Roughly a third of this amount goes for paints and the remainder is spent for other protection and replacement.

In many plants there are numerous opportunities for greater efficiency in methods employed to fight corrosion. A first step would be to designate a competent person to be responsible for a systematic anticorrosion program. Under proper guidance such a program will provide for establishing specifications and tests, diagnosing failures, tabulating experience, conducting periodic inspections and placing many other similar activities on definite schedules.

Once a company has adopted a well planned program instead of hit-or-miss efforts, its attack on corrosion will become more effective.

* * *

LOAD STEEL CAREFULLY: Rules specifying how lengthy iron and steel products shall be loaded and secured on railroad freight cars are rigid. Normally inspection of loadings is thorough. As a result, thousands of carloads of iron and steel are transported to destination every week without incident.

However, on Friday evening, Mar. 27, there was an exception. At 9:58 p.m. lengths of pipe began falling off a gondola in an eastbound freight train on the main line of the New York Central east of Conneaut, O. One section of pipe dented a rail on the westbound passenger track. Two minutes later the westbound Mohawk was derailed by this defect and plunged into the side of a westbound freight train. Moments later the eastbound Southwestern Limited plowed into the debris of both wrecked trains.

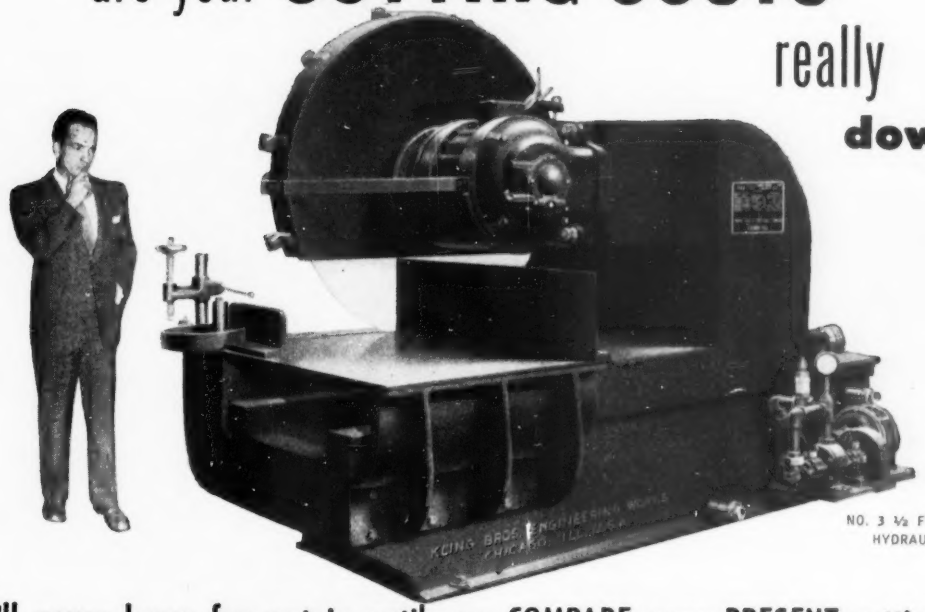
This unusual chain of mishaps cost 21 lives and property damage of several million dollars. It is a costly lesson that one cannot be too careful in loading steel properly.

* * *

MORE BIKES THAN EVER: It will come as a surprise to many readers that of all of the modes of private transportation in vogue at the turn of the century, the bicycle has been the only one that has held its own against the competition of the automobile. In fact, there are 21 million bicycles in use in the United States today (p. 70) which is about 15 million more than were on the roads during the so-called golden age of bicycling from 1900 to 1910.

A rather odd characteristic of this substantial American market for bikes is that it is supported chiefly by youngsters for pleasure and by a few older persons for recreation. In England, on the European continent and in Asia a sizable market for bicycles is utilitarian. People use bicycles to get to or from work. In a large degree, it is a substitute for an automobile.

are your CUTTING COSTS really down far enough ?



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Cuts all types of steel, hard or soft, big or small, in any shape, without distortion. For day-in, day-out production, one Kling Friction Saw will do the volume of work that would ordinarily require several separate shears or slow speed saws. One of the big time-saving reasons is the ability of the Kling Friction Saw to cut any structural shape, without change of blade or setup. Because the average Friction Saw blade will give a good full day's production before requiring redressing, you eliminate costly downtime and also save on tool costs.

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How long would it take you to cut these pieces?		With a Kling friction saw you could do it in approximately . . .
24" 100 lb. I Beam	⊢⊣	28 seconds
15" 55 lb. Channel	⊓	15 seconds
8"x8"x34.3 lb. H Beam	H	10 seconds
100 lb. A.R.A. Rail	I	9 seconds
6-1/2"x6-1/2"x19.8 lb. Tee	T	5 seconds
8"x8"x3/4" Angle	∧	11 seconds
3" Square	■	10 seconds
4" Round	●	15 seconds
6" O.D. Tube, 1/2" Wall	○	11 seconds

*What's your requirement? There's a size to fit your specific needs—large or small.

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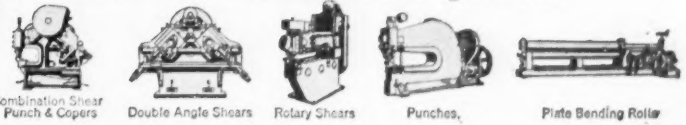

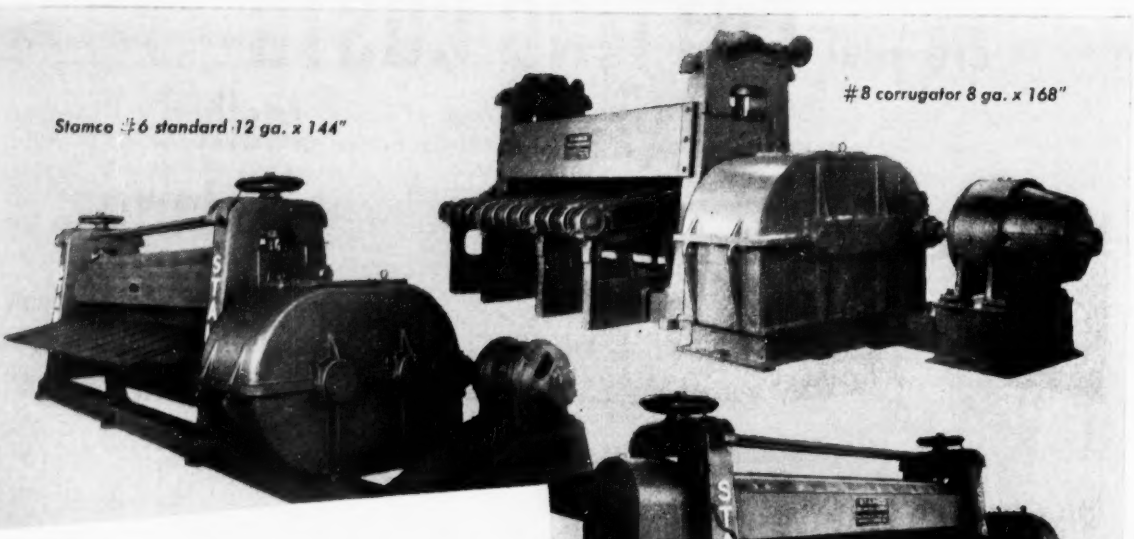

Stamco #6 standard 12 ga. x 144"

#8 corrugator 8 ga. x 168"

For Roll Corrugating and Culvert forming . . . see

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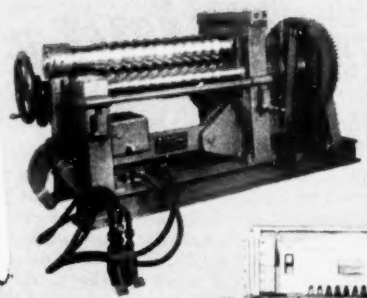
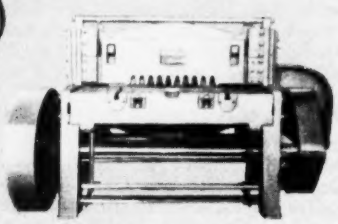
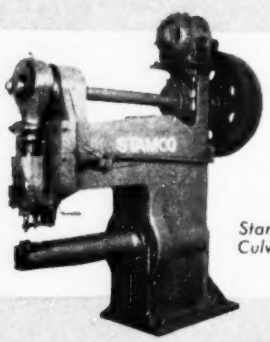


Stamco 8 ga. Culvert Curving roll

Stamco high duty Culvert Punch and Riveter equipped with air operated friction clutch



Stamco 8 ga. x 36" corrugated shear



Stamco standard Culvert Punch and Riveter

STAMCO, Inc., New Bremen, Ohio

STEEL QUARTERLY SURVEY

Inventory—Delivery Position for Parts

APRIL, MAY, JUNE

TIGHTEST—Steel castings, antifriction bearings, forgings

EASIEST—Nonferrous castings, belting, hose couplings

More Components Faster by July

"IF WE WORK hard enough at expediting, we can now closely control our inventory of components and can get nearly anything as fast as we should reasonably expect."

So says a large farm equipment manufacturer who points out that the situation has improved markedly in only the last four to six months. His experiences reflect that of the overwhelming majority of the nearly 150 respondents to STEEL's quarterly survey on inventory and delivery positions for components listed in the table below.

Even Better—The need for continued expediting may also diminish soon because 81 per cent of the components users or makers foresee still more improvement over the next three months. Some 89 per cent say their inventory and delivery conditions are substantially better than a year ago. Although at one time many bought their components from foreign producers and other irregular suppliers, only 2 per cent are doing so now.

About half the respondents say currently their ideal inventory position is 30-60 days for nearly all components. A glance at the table below shows that in 12 of the 21 product groups about half of the companies replying have stocks in the 30-60 day category, a better showing than three months ago. That reveals inventory balance is improving, but it's still troublesome.

Still Problems — "Inventory balance troublesome?" asks a small

IMPROVING: INVENTORIES & DELIVERIES OF COMPONENTS

(Figures are percentages of those replying to STEEL's quarterly questionnaire)

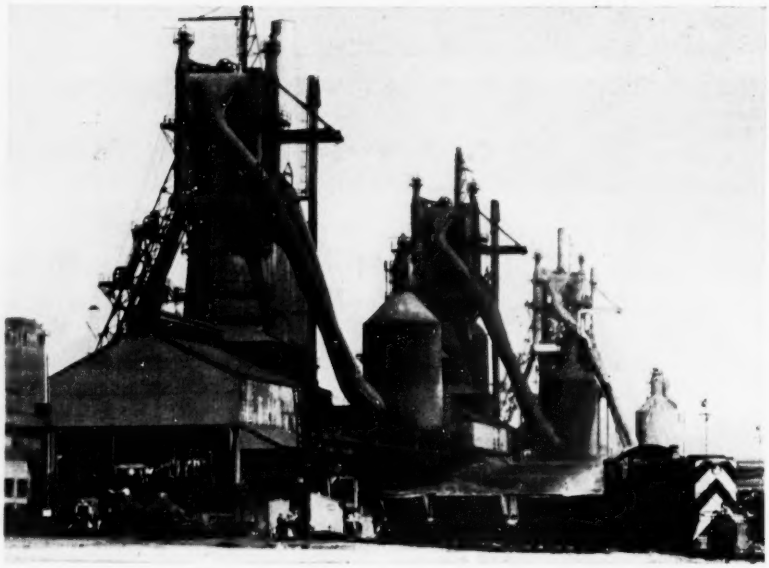
COMPONENTS	INVENTORY POSITION					BEST DELIVERY				
	Under 10 days	10-30 days	30-60 days	60-90 days	3-6 mos.	Under 10 days	10-30 days	30-60 days	60-90 days	3-6 mos.
Antifriction bearings	14	12	53	12	9	20	29	21	18	12
Belting, belt drives	21	26	34	6	13	42	32	22	4	
Castings, die		10	59	17	14	4	15	59	22	
Castings, gray iron		34	43	16	7	25	42	25	5	3
Castings, malleable	3	15	46	26	10		27	48	20	5
Castings, nonferrous	9	25	50	14	2	24	43	29	2	2
Castings, steel	10	12	46	20	12	3	21	45	18	13
Couplings, hose	10	41	28	7	14	27	46	27		
Cylinders, air, hydraulic	17	35	13	13	22	8	35	38	11	8
Elec. equip. (relays, switches, etc.)	4	27	41	18	10	13	40	30	15	2
Electric motors (fractional)	2	25	35	19	19	15	33	26	18	8
Electric motors (1-5 hp)	7	29	32	18	14	25	25	21	16	13
Electric motors (over 5 hp)	12	27	27	12	22	11	32	32	18	7
Fasteners	3	14	53	16	14	20	35	31	11	3
Forgings	2	16	43	31	8		23	38	13	26
Gears	2	9	40	33	16	9	18	30	25	18
Rubber goods, mechanical	4	26	48	18	4	5	45	48	2	
Screw machine products	6	23	33	26	12	9	32	38	15	6
Springs, wire shapes	4	17	47	19	13	6	30	46	18	
Stampings		29	36	29	6	12	12	47	23	6
Weldments	25	25	38	6	6	12	41	23	12	12

Texas firm. "Our 'balance' is nearly putting us flat on our back." Balance, or rather the lack of it, is serious for scattered companies, but they're mostly small or new. Component buyers on the West and East Coasts are having the best time of it; purchasers in the Midwest are hardest pressed. That's because of heavy automotive demands, most of which flow from Detroit. Also plagued by component shortages are companies in industries experiencing unusually rapid growth, such as air conditioning. Suppliers haven't yet accustomed themselves to their specialized needs or caught up with the increasing volumes they require.

All respondents were asked what components are giving them the most trouble. More replied steel castings, antifriction bearings and forgings than any other items. The first and third products are tight because of especially heavy military demand. Although bearings still cause some difficulties, the situation is improving. For example, a major bearings manufacturer a year ago could deliver in six to nine months on his general line. Three months ago deliveries ranged from six to seven months. They're currently varying from two to five months. For bearings and practically every other component made today, unusual specifications or queer lots mean far more extended deliveries than for the general line.

All Clear—At least one respondent had trouble with every component except nonferrous castings, belting and belt drives and hose couplings. Only one company out of 150 (a different one in each case) complained of difficulties with weldments, stampings, mechanical rubber goods, 1-5 horsepower motors and die castings.

Big component inventories are not being built up now because, as a Wisconsin manufacturer puts it, "We don't need high stocks since we're getting better deliveries." An appliance maker also reflects current opinion: "Last year we bought strictly on delivery and quality. Now we're buying on cost and quality." Nearly all purchasing agents agree that a normal inventory-delivery position on components soon will be here.



BLAST FURNACE #3 NEARLY READY AT KAISER STEEL
. . . 657,000-ton capacity made expansion necessary in other operations

Kaiser To Blow in Third Blast Furnace About May 15

KAISER STEEL Corp., Fontana, Calif., expects to blow in its third blast furnace about May 15, says George B. McMeans, vice president in charge of operations. The 25.5-foot hearth furnace will be rated at 1200 tons a day, same as the two existing furnaces.

Other expansion programs at the West Coast steel plant are nearing completion. Part of the 90 new coke ovens are being warmed up and will be making coke in the near future. When all are completed, Kaiser will have a battery of 225 ovens.

Better Tin Plate — Fifth and sixth stands will be added to the United 4-stand, 86-inch mill in the tin plate plant, and they will be ready by August. The new stands will make it possible to roll thinner gages of improved quality. A new shear line for hot-rolled sheets will go in about the same time.

The added capacity necessitated expansions in Kaiser's coal and iron ore mining operations. At the Utah coal mines, modern equipment was installed and the washing plant was enlarged.

Eagle Becomes More Active—At the Eagle Mountain iron ore properties in southern California, a new area, the North-South pit, is being opened to supplement production from Bald Eagle, which is 80 per cent depleted. That pit has supplied about 4.2 million tons of ore so far. The new workings will supply the three blast furnaces for about 25 years, the company believes.

Equipment now being installed at Eagle Mountain includes a new 66 x 84-inch jaw crusher, cars and engines and a beneficiating plant expected to improve quality of the ore which is already running better than 50 per cent iron.

Kaiser's annual capacity is now 1,536,000 tons from nine open-hearth furnaces. To match that capacity, more soaking pits are being added at the Fontana plant.

New Plant for Green River

Green River Steel Corp. will soon open a new plant at Owensboro, Ky. Facilities will consist of electric melting furnaces, soaking pits, presses, blooming and bar mills, annealing furnaces and several slow cooling pits.

The blooming mill will go into operation in May, the bar mill in June and melting facilities in July, the company anticipates. Equipment has been installed for production of alloy and quality carbon steels of all types.

Railroads Seek Rate Help

If temporary increases are not made permanent, capital improvement plans may suffer

IF THE RAILROADS are to continue their program of capital improvement, they claim, they must maintain their present level of earnings based on the temporary rate increases authorized last April by the Interstate Commerce Commission. Therefore, a petition signed by officials of the Eastern Railroads, Southern Freight Association and Western Traffic Association asks the ICC to make the increases a permanent part of railroad freight rate structure.

Greater Need—The need for the increases is greater this year than ever before, the railroads pointed out. Freight cars and locomotives still to be purchased for the program will cost more than $2 billion. Improvement on roadways and structures will add $400 million annually. Payroll since last April's temporary increase has increased over $200 million a year. The latest pay hike—4 cents an hour to 1.3 million workers as a "productivity" increase—will cost the railroad operators another $120 million yearly.

The temporary increase produced about $1 billion in gross annual revenues, the petition says. If rates were reduced by that much, the railroads would be left with less than 2 per cent return on investment. They claim that they need the increased revenue to maintain credit position which makes capital improvements possible.

New Group Fights Tariff Cuts

Long-silent opposition to tariff cuts is flaring as a new group, the Committee of Industry, Agriculture & Labor on Import-Export Policy, pledges a fight against free-trade proposals. The committee, under auspices of the National Labor-Management Council, intends a public information campaign on the low level of today's tariffs.

While Congress will be the stage for the final tariff controversy, tariff supporters are pointing out that the U. S. has lowered tariffs to an average of 12 per cent, compared with 50 per cent in 1933.

Business prospects stack up well for 1953 as . . .

Optimism Soars for Containers, Packaging

Practically everything points to a good year, with emphasis on the first half. Better materials supply and end of controls account for much of the enthusiasm

MANUFACTURERS of containers and packaging materials, like so many other businessmen today, are expressing enthusiastic optimism about business in 1953, reports the Containers & Packaging Division of National Production Authority.

Last year's fluctuating temperament will give way to a pleasantly even tempered 1953, with demand running strong pretty well throughout the year (for details on prospects for individual container-packaging types, see STEEL, Jan. 26, p. 48). That trend, established in the last half of 1952, is evident in January order statistics. Total of new orders for all U. S. container manufacturers was up about 5 per cent in January compared with January, 1952. Unfilled orders exceeded December by about $500,000.

Naturally—One of the big reasons for the optimism is that the industry is no longer hamstrung by controls. When NPA lifted its controls on container operations and materials — cans, packaging closures, collapsible tubes and selenium—the industry sighed with relief. Improved raw materials supply and further lifting of controls will give impetus to that feeling.

In fact, quantities of raw materials available for nondefense container and packaging production in 1953 will be substantially larger, with few exceptions, than at any time since Korea. Some selected alloy metals will remain tough, but over-all, the situation looks good.

Fair Weather—NPA points out that these barometers of business show fair weather ahead, which will affect the container industry no less than any of the others: Defense spending to the tune of 14 per cent of gross national product; almost $1.5 billion more money in circulation than a year ago; bank credit increased about $2 billion over January, 1952. Those factors lead container manufacturers, almost to the man, to tag the first half of 1953 as "exceptionally good," the whole year as at least as good as 1952 and in some cases even better.

NPA points out that container manufacturers' major efforts in 1953 must be concentrated on internal problems for profitable and expanding operation.

Magnesium Becomes Versatile

Producers of the light-weight metal point out new uses and improvements in a Washington exhibition. Their problem: To encourage sales

IF YOU'RE planning to use magnesium in your operations and want assurance of supply, magnesium fabricators and distributors will tell you there's no need to worry.

The industry's problem today is in getting more magnesium in use to build volume and reduce costs. Last year twice as much magnesium was produced as used, the national stockpile absorbing the surplus. A price rise between two and three cents last month makes today's problem more acute.

Spread the Word—The first international magnesium exposition, a $50 million show last week at Washington's National Guard Armory, set about with vigor to convince industry that magnesium's virtues are many and its faults are being overcome. "Too many people think of magnesium as something that corrodes or burns," says J. S. Kirkpatrick, president of the Magnesium Association and research director of Brooks & Perkins Inc., Detroit.

Actually, magnesium sheet, castings and forgings won't burn in air unless a temperature above 1000 degrees is maintained. The metal can be formed at high temperatures by bending, drawing, spinning, pressing, stretching and similar operations.

Corrosion problems are being met by electrolytic and chemical coating methods. One promising finish, developed by Allied Research Products Inc., Baltimore, was announced last week. It's a chromate conversion coating that can be applied at room temperature without special equipment.

Top Customer—The armed services are the biggest single customer for magnesium today. Applications range from 1.5 pounds in the Army Handie-Talkie to 4500 pounds of sheet, extrusions and castings in the C-124 Globemaster. Chief Army uses lie in equipment that must be carried manually or in airborne operations; these were liberally displayed at the exposition.

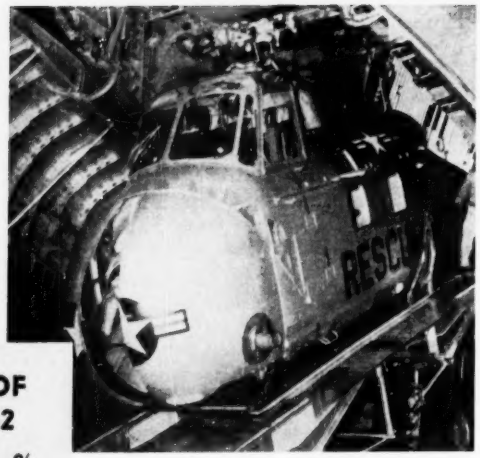
CONSUMPTION OF MAGNESIUM-1952

INDUSTRY	%
Aircraft	29.3
Aluminum Industry	20.4
Electrochemical	8.5
Ground Transportation	7.6
Machinery and Tools	6.2
Chemical and Metallurgical	6.0
Materials Handling	4.7
Electrical Equipment	3.5
Magnesium Powder	2.4
Consumer Products	1.6
Textile Industry	0.8
Printing and Engraving	0.4
Miscellaneous	8.6

Fabricators Busy—Versatility of magnesium use was amply demonstrated at the show by the wide variety of die castings shown by Doehler-Jarvis Division of National Lead Co., New York, and a great range of intricate sand castings made by a number of foundries. Huge forgings were on exhibition, including a 105-pound mortar base plate made by Wyman Gordon Products Co., Worcester, Mass.

A show-stopper was a British hand-built prototype sports car made by Essex Aero Ltd. with all-magnesium body. Processing required pickling and etching, acid dip permite treatment, two coats of zinc chromate and eight coats of cellulose finish.

More Uses — Magnesium's usefulness for materials handling was demonstrated at the exposition. A new portable yard ramp for loading and unloading freight cars from ground level was unveiled by Magnesium Co. of America, East Chicago, Ind. Made in five sizes with capacities from 6000 to 16,000 pounds, the ramp is mounted on two wheels and can be handled by one man.



This Sikorsky S-55 helicopter is almost entirely fabricated from magnesium sheet, has 100 magnesium castings

Harvey Begins Alumina Tests

A new industry may soon appear in the Pacific Northwest. Harvey Machine Co. Inc., Torrance, Calif., purchased a government-built experimental alumina plant in Salem, Oreg. The acquisition followed several months of negotiation with the government's General Services Administration.

Harvey's new facility will serve as an experimental pilot plant.

Nicaro To Sinter Nickel

Sintering equipment costing about $750,000 will be installed at the government-owned Nicaro Nickel Plant in Cuba. It will produce nickel in small heavy pellets, a form more widely usable than the present nickel oxide powder.

The facilities will be in operation in about eight months. The sintered product brings about 2 cents a pound more than the powdered form, and General Services Administration, which operates the plant, believes the new equipment will pay for itself in about three years. It will be installed by the Freder-

ick A. Snare Corp. of New York.

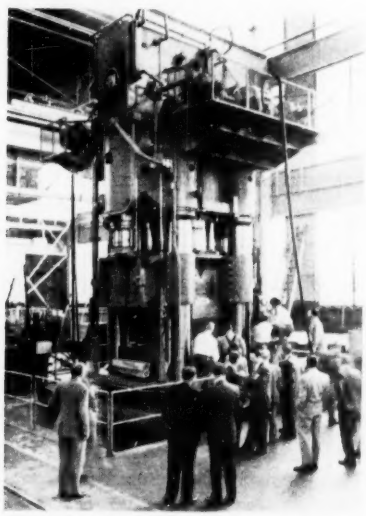
Powdered nickel can be used only in electric furnaces unless specially packaged. The pellet form can be used in both electric and open hearth furnaces. However, some of the Nicaro production, estimated at about 2 million pounds per month, will not be sintered, because the oxide is preferred for a number of special processes.

U. S. Buys More Ontario Nickel

More nickel will be available beginning this year as the result of a contract signed between the U.S. government and Falconbridge Nickel Mines Ltd., Toronto, Ont., calling for production and sale to the United States of at least 100 million pounds of the critical metal by mid-1962. There is a possibility of obtaining an additional 100 million pounds by mid-1967.

Falconbridge will ship at least 2 million pounds of nickel to the U. S. by the end of this year. However, this will not remove the metal from the "most critical" list.

The contract also calls for the sale of up to 2 million pounds of cobalt by June 30, 1962, and up to 52 million pounds of refined copper by Dec. 31, 1958.



Impressive Demonstration

Aircraft engineers visiting the Hydraulic Press Mfg. Co., Mt. Gilead, O. watch a demonstration of the company's latest—a 7000 ton commercial model Hidraw press with added Guerin and die quenching features. The press was designed with the co-operation of Consolidated Vultee Aircraft Corp. and other aircraft manufacturers

EMPLOYEE STOCK OWNERSHIP PLANS

MANUFACTURING	Total	Present Status of Plans: Active	Inactive	Discontinued
Chemical	4	2	2	—
Electrical products	5	2	—	3
Food & beverage	6	2	4	—
Machinery	8	3	5	—
Medical instruments	2	1	1	—
Metal products	9	4*	2	3
Paper products	2	1	—	1
Petroleum	3	2	1	—
Publishing	2	—	1	1
Shoe manufacturing	1	1	—	—
Textiles	1	1	—	—
Total manufacturing	43	19	16	8
NONMANUFACTURING				
Banking and investment	1	—	1	—
Mercantile	2	2	—	—
Public utilities	22	7†	13	2
Total nonmanufacturing	25	9	14	2
TOTAL	68	28	30	10

*In one company, plan proposed, not yet installed.
†In two companies, plan proposed, not yet installed.

Workers Become Owners

ONCE AGAIN programs to encourage sales of company stock to rank-and-file employees are catching industry's eye. Employee ownership plans, widespread in the 1920s, are starting to regain the popularity they lost during the lean 1930s.

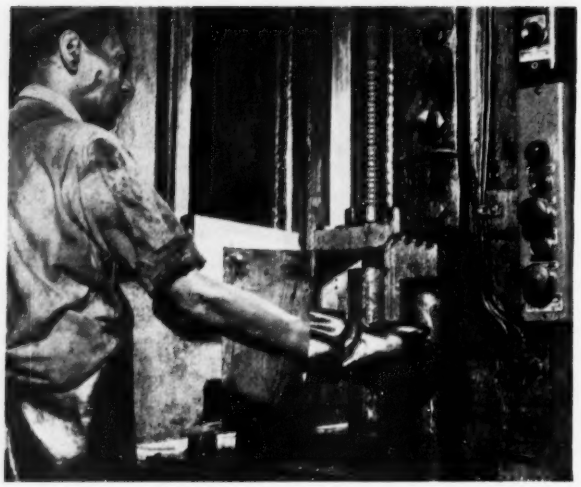
Interest in programs for employee shareholding has been slow to revive, however. Most manufacturers still are hesitant to launch special issues for employees since many workers during the depression were caught with too many eggs in company baskets. A survey by the National Industrial Conference Board reveals that only 68 companies (see above) have tried employee stock purchase plans recently. Another 18 include some stock purchase in their employee savings programs. General Electric Co. is the only metal-working firm among them; most of the rest are oil companies.

Buying At Option—A significant factor in recent years is the emergence of option programs for employees. Under these programs—which were formerly reserved only for executives—a certain amount deducted from the worker's pay is held in account until enough is collected to cover the cost of the desired number of shares. Should the worker change his mind during this interval, the accumulated money is returned to him.

Such a plan is being extended another year by Westinghouse Electric Corp. Some 22,268 employees are now enrolled in the company's current shareholding plan and have purchased 467,752 shares of common stock. The program was started in 1950.

Money Back—A company starting an option program is Armco Steel Co. Its executives say they are submitting to stockholders an option plan for approval. Purchase price of the shares would not be less than 95 per cent of market value on the date option is granted. Payments would be made over a three-year period with options exercisable in the third year.

Watching the reawakened interest in employee shareholding, many manufacturers may soon follow suit. The advantages are sizeable. Principal benefits are: Workers show greater interest in and devotion to the company and working capital is obtained for the company's operations.



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Blasting Away at the Shell Shortage

PITTSBURGH STEEL CO., Pittsburgh, and Lehigh Foundries Inc., Easton, Pa., comprise one industrial team forging lethal accuracy into 4.2-inch mortar shells. These photographs, taken at Lehigh Foundries, show steps that spell one answer to talk of ammunition shortages overseas.

Pittsburgh Steel produces the high-carbon, high-manganese open hearth steel that goes into the shells and cold draws it into seamless mechanical tubing. From the tubing, Lehigh Foundries manufactures the finished shell cases.

For each shell the tubing must be sized to a tolerance of less than .015 inch, a nose tapered and machined, and a baseplate fitted. When packed for shipment the shell has been cleaned, bonderized, painted and inspected by Army Ordnance Corps inspectors.

Accuracy built into these shells comes from close control of raw materials, exact weight and dimensions, assuring the infantryman's continued respect for his heavy mortars.

In addition to 4.2-inch mortar shells, Lehigh Foundries are making castings for 60-mm and 81-mm mortar shells, 155-mm illuminating shells and anti-personnel mines. During World War II Lehigh Foundries won four Army-Navy "E" awards for producing 25 million rounds of ammunition of all descriptions.

1. Sections of cold-drawn tube are expanded by a tapered reamer in a 125-ton Bliss hydraulic press.

2. Nose and ogive of the 4.2-inch mortar shells are cold formed on a 150-ton Elmes press.

3. As shells near completion they are inspected under the supervision of U. S. Army Ordnance.

4. Completed mortar shells, ready for packing and shipping, reach the end of the production line.

3

4

Opportunities Ahead

Manufacturers will find many chances to subcontract as new atomic weapons are developed

MANUFACTURERS on the lookout for defense subcontracts won't find their opportunities diminished much if the fighting in Korea ends soon.

Korea's take of defense expenditures is only $1 billion for each $5.57 billion spent elsewhere. Defense outlays have risen from $14 billion a year before Korea to the current annual rate of about $46 billion. Of the present total, around $7 billion a year is used for Korea and $36 billion is being spent on defense projects in the U. S. and other parts of the globe.

More Jobs—Defense production is offering more subcontracting chances today than in any period since the top production days of World War II. Mass output is to the fore as most defense producers are already geared with the heavy equipment. Subcontractors are finding more and more jobs to make component items.

Also in subcontractors' favor are the new weapons being developed. The many and complicated parts making up these weapons are good items to subcontract. Atomic missiles for submarines may be one such weapon. The Navy discloses that it has in operation a submarine carrying a guided missile capable of blasting inland targets with atomic warheads. The jet-powered missile, called the "Regulus," is 30 feet long and is installed in a special hangar attached to the submarine's deck. Under development for five years, the missile is now in production at the Dallas plant of the United Aircraft Co.

Atomic Subs—Meanwhile, development of atomic engines to propel submarines is well underway. The Atomic Energy Commission says that a thermal reactor prototype plant for subs has successfully entered its first operation tests at AEC's reactor testing station in Idaho. Scientists at the station have started an atomic fission chain reaction in the power plant. Further tests will bring the reactor to full power to determine operating characteristics.

NPA Appointment

Earl P. Leeds, director of sales of Brown & Sharpe Mfg. Co., Providence, R. I., takes office Apr. 6 as director of the NPA Metalworking Equipment Division. Mr. Leeds has been serving as deputy director of the NPA division. He succeeds Donald M. Pattison, vice president in charge of sales, Warner & Swasey Co., Cleveland who is returning to his position with Warner & Swasey

Federal Contract Awards Jump

Construction contract awards financed entirely or in part with federal funds hit $4.4 billion in 1952, according to preliminary figures from the Bureau of Labor Statistics. That's nearly three-fifths of the all-time high, $7.9 billion in war-time 1942, and 5 per cent above 1951.

Awards for federally-owned industrial plants jumped 35 per cent over 1951 dollarwise—from $782,384,000 to $1,225,749,000—largest dollar increase in any category from the previous year. Money for federally-aided highways increased 17 per cent to a record total of nearly $1 billion in 1952.

CHECKLIST ON CONTROLS

Materials Orders

COLOR TV—NPA Order M-90, which required the securing of NPA permission to mass-produce home-type color television receivers, was revoked, effective Mar. 26, 1953.

USED RAILROAD EQUIPMENT — NPA Order M-64, which provided for the allocation of used railroad rails, used axles and used cast iron car wheels, was revoked, effective Mar. 30, 1953.

MARINE MRO SUPPLIES — Amendment of Mar. 30, 1953, of NPA Order M-70 provides that during the second quarter, owners and agents of foreign and Canadian flag vessels may, within limits, self-certify for MRO supplies and minor capital additions. It was effective Mar. 30.

CHRYSOTILE ASBESTOS FIBER—Amendment of Mar. 31, 1953, of NPA Order M-96 permits use of grades 3F, 3K, 3R, 3T and 3Z chrysotile asbestos fiber in unlimited quantity in the production of the following items: Theater safety curtains, gun covers, ironing board covers, passenger car woven brake linings less than ¼ inch thick by 2 inches wide and oil-burning wicking. It was effective Mar. 31.

Controlled Materials Plan

NICKEL STAINLESS STEEL — Amendment of Mar. 26, 1953, of Direction 20 to CMP Regulation 1 states that nickel-bearing stainless steel may no longer be purchased on unrated orders under the open-ending arrangement of the direction. It was effective Mar. 26.

Appointments in Washington

Edward F. Howrey, Washington lawyer, was confirmed by the Senate as a member of the Federal Trade Commission for a term expiring Sept. 26, 1959.

Harold L. Aitken was named executive assistant administrator of the Federal Civil Defense Administration.

Francis V. du Pont, Wilmington, Del., was named commissioner of the Bureau of Public Roads, Commerce department.

Ormonde A. Kieb, Maplewood, N. J., was sworn in as assistant postmaster general for facilities, Post Office Department.

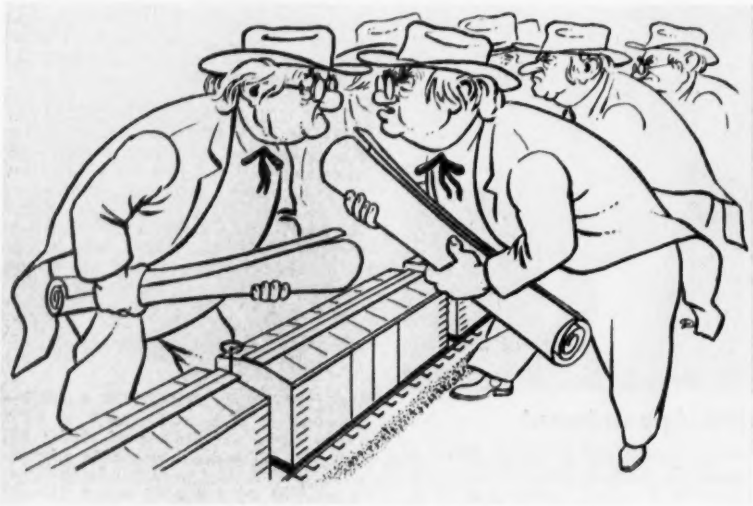
Stanley Nelson Barnes, a member of the California Supreme Court, has been named Assistant Attorney General of the Antitrust Division, Justice department.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Truck Parts	Mack Mfg. Corp., New York
Fuzes, Grenade	Bayshore Industries Inc., Elkton, Md.
Boosters	Sargent & Co., New Haven, Conn.
	Robertshaw-Fulton Controls Co., Robertshaw Thermostat Div., Youngwood, Pa.
Airplane Crash Cranes	R. G. Le Tourneau Inc., Peoria, Ill.
Wheel Assemblies	Aerol Co. Inc., Burbank, Calif.
Generator Sets	R. H. Sheppard Co. Inc., Hanover, Pa.
Synchros	Martin-Parry Corp., Toledo, O.
Radiacmeters	A. O. Beckman Inc., S. Pasadena, Calif.
Winches	Lake Shore Engineering Co., Iron Mountain, Mich.
Boilers	Cyclotherm Corp., Oswego, N. Y.
Locomotives	Baldwin-Lima-Hamilton Corp., Eddystone, Pa.
Cameras, Motion Picture	Mitchell Camera Corp., Glendale, Calif.
Lamps	Radiant Lamp Corp., Newark, N. J.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*



FIGHT BEGINS OVER FREIGHT ABSORPTION
. . . who is on the wrong side of the tracks?

Congress takes sides on legalizing freight absorption. Senate bill would allow sellers to pay some expense of transportation to meet competitors' prices

BATTLE LINES again are forming in Congress on the issue of legalizing freight absorption to enable a seller to meet his competitors' delivered prices.

Leaders on the "pro" side are Senators Homer E. Capehart (Rep., Ind.) and Pat McCarran (Dem., Nev.). Chief of the "con" faction is Sen. Estes Kefauver (Dem., Tenn.). Bills are now in judiciary committees, and a fight will occur when the legislation comes up for debate.

Stormy History—The controversy dates back to the 80th Congress, when more than 100 witnesses were heard. In the 81st Congress, S. Res. 1008 would have established the legality of freight absorption, but it was vetoed by President Truman. A similar bill, S. Res. 719, passed the 82nd Senate, but adjournment came before House action.

Leading "pro" bill in the present Congress is S. Res. 1377, sponsored by Senator Capehart, with the backing of Sen. Edwin C. Johnson (Dem., Colo.). Carefully drafted to accord with applicable Supreme Court decisions (Standard Oil Co. vs Federal Trade Commission and FTC vs Cement Institute), it would permit a seller "who is acting in good faith and is not in collusion with anyone to pay part or all of the cost of transportation on sales to a customer in order to meet a lower price which a more favorably located competitor offers to that customer."

Industries Endangered — Industry opinion, which overwhelmingly backs the Capehart-Johnson position, is summarized by Harold T. Halfpenny, Chicago attorney for the National Standard Parts Association, who says that FTC decisions in the National Lead Co. and Chain Institute cases imperil all industries in which manufacturers distribute their products through wholesalers who are strategically located through the nation.

Senator Capehart declares that his bill has no concealed loopholes and will not permit sellers to use basing point systems as that term is defined by the Supreme Court. Legislation is required, he insists, to foster a free, competitive economy with the maximum number of sellers competing for each buyer's business. "Had the legality of freight absorption been clarified four or five years ago," he remarks, "I am certain that buyers would have been saved many millions of dollars during the period since the Korean aggression."

Kefauver Disagrees — Senator Kefauver's bill, S. Res. 1357, would reject "good faith" as a complete defense to a charge of price discrimination under the Robinson-Patman Act.

"In the Standard Oil of Indiana decision," says Senator Kefauver, "the court largely nullified the rule underlying the Robinson-Patman Act. The essence of the court's interpretation is that wherever FTC challenges a discriminatory practice and the supplier shows that he has carried on that practice in good faith, the government can't issue a cease-and-desist order."

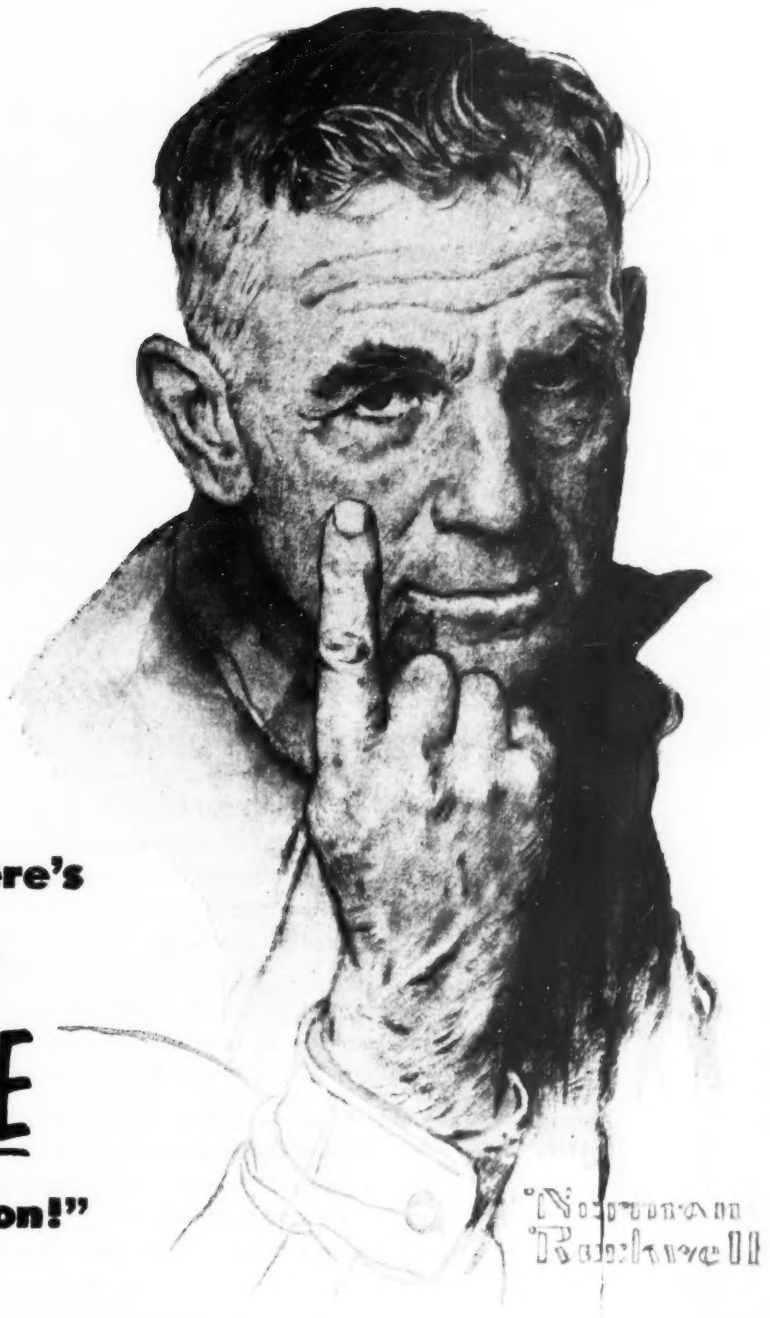
Kefauver contends that, as the law now stands, there is no limit on discriminations as long as they are made in good faith.

Business States Its Case . . .

"Get the government out of business!" That was the theme of the Conference of American Small Business Organizations which brought to Washington small businessmen from all sections of the country.

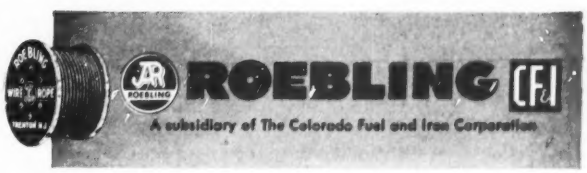
Sandwiching reports in between speeches by members of Congress, various convention committees called for a balanced budget, a constitutional limit on income taxes and strengthening of the Taft-Hartley Act. Members opposed direct or indirect subsidy of small business with public funds, extension of the excess profits tax and rent control.

Speakers encouraged abandonment of fixed farm price supports and adoption of flexible programs instead. Others called for a sterner uprooting of subversive individuals in the government while favoring withdrawal from the United Nations. Meanwhile they asked Congress to make certain that resources of small business be tapped before launching new expansion.



IT'S JUST THAT SIMPLE. There's only one reason in the world why 2 out of 3 wire rope users in the industrial field prefer Roebling wire rope... *it costs a lot less on the job than any other.*

For maximum wire rope efficiency and economy, call your nearest Roebling office for a Field Man. He'll recommend the best ropes for your operations.



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CMP strip can be made to fit the most exacting needs, whether it be in terms of close tolerances, uniformity of structure, temper, finish or physical properties. The use of specially prepared CMP strip made to the measure of a particular processing or end-product requirement is contributing to lower total costs for many manufacturers. We'll welcome the opportunity to "try CMP strip for size" in your fabricating or assembly operations. Don't compromise steel quality for first steel cost.

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Mutual Aid Means Give and Take on Both Sides of the Atlantic

U.S. tanks of Italy's "Ariete" division, left, stretch out to the horizon at Verona, Italy. This division and another are completely equipped with these M-47s, M-26s and self-propelled American-made guns. This Swiss-built, U.S. Air Force-owned machine, right, grinds jet engine gears automatically at General Electric Co.'s Lockland, O., jet center

How Good Is Technical Assistance?

National Planning Association will study the problem in Latin America. The answers may evolve a better, cheaper way of helping friendly foreign countries

WITH FOREIGN AID becoming an onerous burden, both to the U. S. and recipient countries, the time has arrived to get an objective, hard-headed evaluation of alternate ways to help friendly countries grow stronger.

That's exactly the purpose of the National Planning Association's study of technical assistance programs in Latin America.

Attention on Industry—Private industry men have a big stake in the problem, too: They've been carrying on their own technical assistance programs for at least as long as the govenment has; the people receiving the assistance are their past or potential customers. So, NPA's survey will give a great deal of attention to private concerns' activities.

NPA plans to send teams of American technicians into Latin American countries, under the direction of Theodore W. Schultz, professor of economics and chairman of the Department of Economics, University of Chicago, to get answers to the questions outlined below.

The technique will be to talk with industry men, farm and labor leaders, government personnel and leaders of thought to assess the worth of the various forms of technical assistance in all Latin American countries.

Steel Mills To Contribute—Agricultural extension programs will be studied early in the plan. Steel mills and other metalworking concerns will be asked to contribute from their experience.

This is not a government-sponsored nor government-fostered evaluation. Money is to come from the Ford Foundation, $400,000. It will take about two years to complete, but staff reports are to be published by NPA for public consumption as field studies in Latin America are finished, says H. Christian Sonne, NPA chairman.

Latin America Will Help NPA Answer These

Are technical assistance programs making a real contribution to the long-range interests of the U.S. and Latin America in world peace?

What are the present objectives of technical assistance in Latin America? Are they achieving these results? Which objectives have the greatest value for the future in Latin America and elsewhere?

Where should private technical assistance programs end and public programs begin?

What are the best techniques for providing assistance, especially in administrative co-ordination?

How can technical assistance programs be developed so that future technical aid will not be required?

Bike Makers Roll Easier with Push from Steel Producers

ONLY THE BICYCLE is holding its ground with automobiles in the struggle for individual transportation. Where the hansom cab, horse-drawn hack and most cable cars and electric trolleys succumbed, some 21 million bikes still roll along.

There is one bike for every two and one-half automobiles and trucks; actually, 15 million more bikes are on the road now than during the generally accepted golden age of bicycling at the turn of this century.

Rolling Production—Eleven manufacturers in the U. S. assembled slightly more than 2 million "wheels" in 1952. They plan to better production this year. Including accessories and replacement parts, bike making becomes a $175 million industry, employing 80,000 workers.

That production and sales record by a relatively small group of manufacturers is remarkable because the industry faces difficult problems, not the least of which being imports of lightweight bicycles, notably of British make. And imports are continuing to increase; 225,000 bikes came in last year, valued at $5.6 million plus parts sales.

Coaster Not a Break—The domestic industry asked for tariff relief last fall and was turned down. Later, on Oct. 29, a price increase of seven per cent over highest selling prices since July was authorized. The price lid raise meant nothing as competition, domestic and foreign, was and is too keen to permit higher prices. Meanwhile, costs are rising and foreign-made bikes can be sold at retail for near or below prices domestic manufacturers must bill their distributors.

Several American manufacturers produce lightweight models, surpassing in quality and efficiency most imported bicycles of a similar type, but at somewhat higher cost. To meet European competition, some consideration has been given to increased production of lightweights, but more than 90 per cent of domestic production is in the sturdy balloon tire de luxe model. With rare exceptions, imported bikes are variable as to quality, often more complicated in operation, requiring more frequent repairs.

Riding with Age—Two features most quickly noticed in the bike manufacturing industry are elderly skilled employees and old veteran companies. The average age of employees in the industry is 45 to 50 years with 15 years employment: One veteran company, Westfield Mfg. Co., Westfield, Mass., has been making bikes for 76 years, starting with high front wheelers with pedals attached.

The bike Junior propels over smoother roads or sidewalks today differs greatly in appearance and efficiency from the old model Columbia, so proudly pedalled by his granddad (the Columbia is still being made by Westfield Mfg. Co.). Junior's bicycle is a de luxe machine with many gadgets which were missing from earlier "wheels." For courting or pleasure, you can still buy a tandem, or bicycle built for two, from either Arnold Schwinn & Co., Chicago, or the Colson Corp., Elyria, O., though.

Boys, Two-to-One—Sales of boys' bikes are two-to-one over girls' models. Retail sales are highest at Christmas time and continue active through first quarter. From 60 to 65 per cent of production is normally done in the second half of the year.

Some bike makers also produce other children's wheeled goods, wheel chairs, casters, metal furniture and hospital equipment. At one time or another about half of the industry has had small defense contracts since Korea; during World War II, they went 100 per cent on armament.

In Gear—Steel supply for bike manufacturers is rapidly straightening out, except for nickel-bearing grades (for steel needs of the industry see the box above). In fact, the bike industry gives much credit to steel producers for making possible the 2-million-plus output last year. Few expected to reach that volume; peak post-war output being 2.8 million in one year.

This year should see the industry roll up even nearer the peak.

Steel in a Wheel

THE AVERAGE 26-inch de luxe boy's bike takes 63 pounds of steel and the bike-making industry consumes about 60,000 tons of steel a year. Included in that total in order of volume are cold-rolled sheets and strip, mechanical tubing, hot-rolled bars, hot-rolled strip, wire, cold finished bars and bolts, nuts, washers and rivets. Chain is used extensively, also ball bearings, springs, forged crank and coaster brakes. There are ten ball bearings to ease loads on the human power plant, including two in each wheel.

The British lightweight bicycle weighs an average of 35 pounds. Most have three speed gears and controls more concentrated in handle bars.

Tubular Goods Look Good

"Tighten your belts and use your usual ingenuity to cope with a possible shortage of pipe over the three to six months beginning June 30. After that, if all goes rea-

sonably well, you may once again have a supply salesman sitting in your anteroom." That's the advice Emmett A. Vaughey, director of the Production Division of Petroleum Administration for Defense gave the North Texas Oil & Gas Association in Wichita Falls, Tex.

After controls go off June 30, oil country tubular goods will be considerably tighter than in second quarter, Mr. Vaughey said. By fourth quarter, however, the situation should be more normal and everybody should be able to breathe a little easier.

He also said that PAD was designed to protect the smaller operators, but when controls die the smaller operator must fend for himself. He will be the hardest hit until the situation settles down later this year or possibly first part of next year. The picture is much brighter for 1954 and 1955.

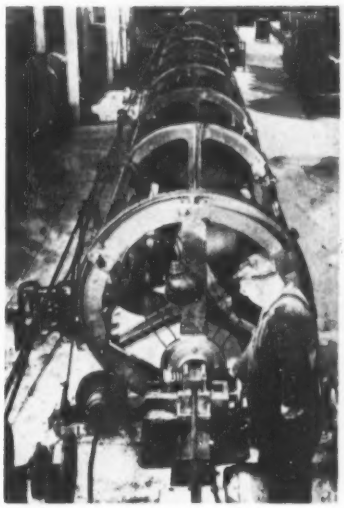
RFC Not Dead Yet

Small business loans up to $1 million will still be made by Reconstruction Finance Corp., at least for a while, even though the RFC is already on the road toward liquidation by June 30, 1954. No more loans over that amount will be made by the agency. Following the White House decision on Mar. 21, about 50 per cent of the agency's offices will close within the next 60 days.

The action does not shelve the bill in the Senate which would kill RFC on Jan. 1, 1954, and transfer its small business loans function to the Federal Reserve Board.

Chromite Due from Alaska

The Red Mountain (Alaska) chromite deposit will yield 13,000 long tons of chromite under a working agreement between Kenai Chrome Co. and the Defense Materials Procurement Agency. The agreement calls for a DMPA advance of $110,000 for opening the mine and installing necessary facilities, including a loading dock for vessel shipment to the state of Washington, and up to $200,000 for working capital. It runs through 1955. By that time Kenai is expected to continue production on its own.



Strands of wire rope are wound together in a closing machine at E. H. Edwards Co., San Francisco

More Competition in Wire Rope

Wire rope producers fear sales may lag in construction and shipbuilding after 1953

IS THE MARKET for wire rope as strong as the product? Many manufacturers are saying their sales outlook after this year is not as favorable as in 1952.

Demand Slows—Producers explain that demand from two good customers, the construction industry and highway building, may level off in 1954, while competition is now becoming the rule of the day.

Some 35 companies produce tough, durable wire rope and cable for use in oil well drilling, excavating, construction machinery and shipbuilding. A predominantly civilian industry, with less than 10 per cent of yearly sales of about $110 million going to defense activities, rope-making suffers when long-range construction forecasts drop. As purchases of cable are made well in advance of actual building, the industry may be feeling the effect of a future decline.

Materials Handling—The largest single use for wire rope is in moving heavy equipment. Cranes and elevators employ some of the strongest cable, with tensile strength of as much as 270,000 pounds per square inch. Increasing orders from oil wells making up part of the slack caused by lagging construction and shipbuilding demand.

Few manufacturers confine their activities to wire rope. Major steel companies have rope-making divisions, and producers such as E. H. Edwards Co., San Francisco, are entering the wire specialty field more strongly. Edwards makes fish netting, garment hangers and increasing numbers of wire products as well as cable, and thus has gained 30 per cent in sales within the last seven years.

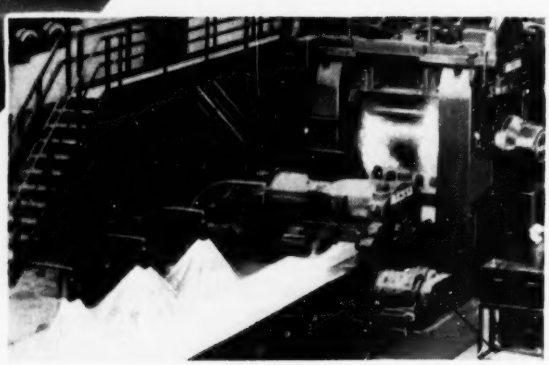
Entire Line — Upson-Walton Co., Cleveland, rounds out its rope production with drop-forging of tackle blocks and fittings such as hooks, swivels and clips to hold the rope. Small firms often forge blocks and fittings along with a variety of other work.

As competition grows tighter among American companies, several foreign producers are entering the market. Here foreign manufacturers, mainly English, are at a disadvantage in the lack of a distribution system where short lengths of specialized wire rope might be readily obtained.

Optimistic Signs — Fortunately, material shortages are considerably improved over a year ago. A Pittsburgh producer says delivery dates on steel rods are about 50 per cent better than in 1952. "Now we can fill our orders quickly," industry men remark, "but we won't know whether our market is holding up until the summer building season starts."

When there's a BIG bearing job to do...

American steel companies are pushing production to a new all-time high, to meet the demands of higher civilian and defense needs. It means steel mill equipment and component parts have a bigger, tougher job to do. Keeping pace with this job are Hyatt Roller Bearings. Specified throughout the years by the country's major mills and builders of mill equipment, Hyatts are still leading the way—meeting these greater demands with advanced methods of manufacturing, modern heat treatment and rigid inspection from raw materials to finished bearings. As a result, Hyatts virtually eliminate friction, reduce wear, require a minimum of attention and help provide longer equipment life. There's a size and type of Hyatt Roller Bearing for every steel mill application. Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.



HYATT ROLLER BEARINGS

By FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom

The V-8 engine, when generally adopted by all automakers by 1956, will influence styling. The power plant is lighter and smaller, will give more flexibility to designers

DETROIT

THIS WEEK it looks definite—the "V" for V-8 and hoped-for sales victory should emblazon at least one hood line in every automaker's offering by 1956. Planning by all automakers appears to be headed that way. Tooling should not bar the road and the portent is some *truly major* auto styling changes very shortly.

Behind the swing to the overhead valve V-8 is no primordial hot-rod instinct on the part of the automakers. Greater engine efficiency in terms of increased power to weight and better fuel economy are the basic factors. Here, roughly, is the way it came about.

Explanation—One of the auto engineer's chief objectives is to enable the automobile to travel ever farther on a gallon of gasoline. However, the car must retain the performance characteristics demanded by the American motorist. One way of achieving this aim known to every high school boy who has owned a Model A is simply to compress the fuel-air mixture to a greater extent before it is ignited by shaving the head and increasing the compression ratio.

As many high school boys also learned the hard way, this increases engine stresses and the hottest Model As had exceedingly short lives. In an eight cylinder engine, rising stresses call for a crankshaft carrier and bearing between each crank throw. That adds up to nine bearings, and while it's being done by at least one automaker, engineers feel that the V-8 which accomplishes the trick with merely five is not so overbearing.

Angles—Another factor is the matter of fuel distribution. With a single carburetor and single intake manifold, some of the cylinders are "starved" since they must draw farther or against greater vacuum in the manifold than other cylinders. To minimize starving, the mixture of the remaining cylinders had to be made somewhat on the rich side in a sort of unhappy median. With the V-8, the intake manifold can be compounded in such a way that no barrel of the carburetor or branch of the manifold is drawn upon twice in succession giving the manifold pressure a chance to rebuild a healthy diet. Dual carburetion on a six gives similar results, but four barrels on an eight approaches more closely the ideal of a carburetor for each cylinder.

Of less theoretical import to the average motorist is the simple fact that a V-8 of given displacement is shorter than an in-line engine of the same capacity. The block of the new Buick is 13½ inches shorter than its straight predecessor. In addition, the over-all height of the motor is reduced 4 inches. That to an auto designer means two things—an inherently more rigid block structure of lighter weight, and just acres of new room to move things around in. It is the latter aspect which will alter styling.

Room for Styling—Hood lines are going down to give increased visibility. Motors can be pulled back from the front axle to give better weight distribution. Wheelbases can be shortened for greater maneuverability. Passengers can be moved further forward between the much-touted axles. Less weight in the front end will help handling. Lower hood lines will lead to lower body lines and lower centers of gravity for better roadability.

The whole thing looks just peachy except for Harry Horsepower, average motorist. Harry has known for a long time that a long, high hood meant power and the auto designers are made aware by their sales departments of Harry's beliefs. Consequently,

Wide World

"Mighty Mite" Meets a Relative

Latest version of the familiar Jeep is the "Mighty Mite" (left) developed by the Marine Corps to be flown into combat by helicopter. The midget, shown nudging the current Jeep (right), is only 96 inches long, weighs 1496 pounds, has all-wheel drive and runs like a rabbit. It seats two comfortably

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if you take a look under the hood of most newcomers to the V-8 field, the radiator is a major distance back from the grill and the engine in turn is a goodly yardage back from the radiator. The cheeks of the engine protrude only slightly from beneath an air cleaner that could handle a furnace heating a six-room house, for to Harry the air cleaner is "engine" and reeks of two-hundredish horsepower.

Besides, that big engine cavern must be filled with something and hoodlines must be sustained until the psychological resistance to sensible design can be slowly overcome an inch at a time.

Technique—Designers hope to satisfy some of Harry's demand for length and "sweep" with fenders. Fender lines are going to be made to do the work of conveying length and power as the hood slowly falls between them. Then when that has been done, and it may not take too long if the Studebaker efforts to pave the way meet with success, a brand new idea of dropping the fender lines to give Harry a look at the sides of the road will come along. And then, perhaps about 1960, the car of tomorrow will be well on the way to being the car of today.

Car of the Week

A week spent driving a Chrysler New Yorker leaves an over-all impression of a living room on wheels. Interiors are spacious, comfortable and luxuriant without dangerously protruding knobs and garish gadgets. The padded dash cowl is a noteworthy feature to promote safety.

If you're trying to make the decision on power steering, don't rely on a trip around the block to tell you the story. Power steering is something that must be lived with until your driving habits have adapted to it. One hand tends to work against the other until you're used to the minimal wheel pressure required and the first sensation is one of driving on ice. The answer seems to be driving with only one hand placed at the bottom of the wheel.

One finger is sufficient to spin the wheel in either direction using the wheel spoke like a boat tiller at highway speeds of 60-70 miles an hour. With the Chrysler 16 to 1 steering ratio which power steering permits in a car of this size, control is phenomenal. Road shock disappears and correction for road surface deflection becomes effortless. From 50 right on up the clock to an indicated 110 miles per hour where editors turn chicken, the car gives the sensation of being a thing alive.

The Chrysler transmission is the one weak factor in the car as Chrysler engineers well know. When you step on the accelerator at a traffic light, plenty happens under the hood—not much happens at the rear wheels. You can expect to see a dig-in transmission to go with that beautiful engine one of these days.

The term "beautiful" is used here advisedly. Skirts on the pistons are diamond-turned, tappet holes are machined in the block to such close tolerances no selective fitting is required. Multiple gaging checks 36 dimensions on the crankshaft simultaneously giving the operator a simple "OK" or "reject" answer and rocker armholes and shafts are held to two-tenths tolerance for silent operation.

But perhaps the most impressive thing in the engine manufacture is the machine which balances the entire engine with torque converter after assembly. The engine is suspended by wires and turned over at 400 rpm by an electric motor. Any imbalance is multiplied by an electronic device which (A) actuates a drill which removes the precise amount of metal required from the crankshaft damper to balance the front of the engine, and (B) actuates an electric welding arm which feeds out and welds precise quanity of metal required on the torque converter rim to balance the back half of the engine.

The result of it all is a truly goin' machine.

Auto, Truck Output
U. S. and Canada

	1953	1952
January	612,829	424,559
February	623,530*	464,557
March		525,024
April		570,464
May		542,559
June		542,478
July		226,134
August		322,755
September		595,715
October		656,767
November		548,782
December		569,715
Total		5,989,509

Week Ended	1953	1952
Feb. 28	167,779	118,397
Mar. 7	158,825	115,128
Mar. 14	165,762	120,392
Mar. 21	169,923	125,347
Mar. 28	179,909	132,850
Apr. 4	177,000*	125,668

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary

Exhaust Notes

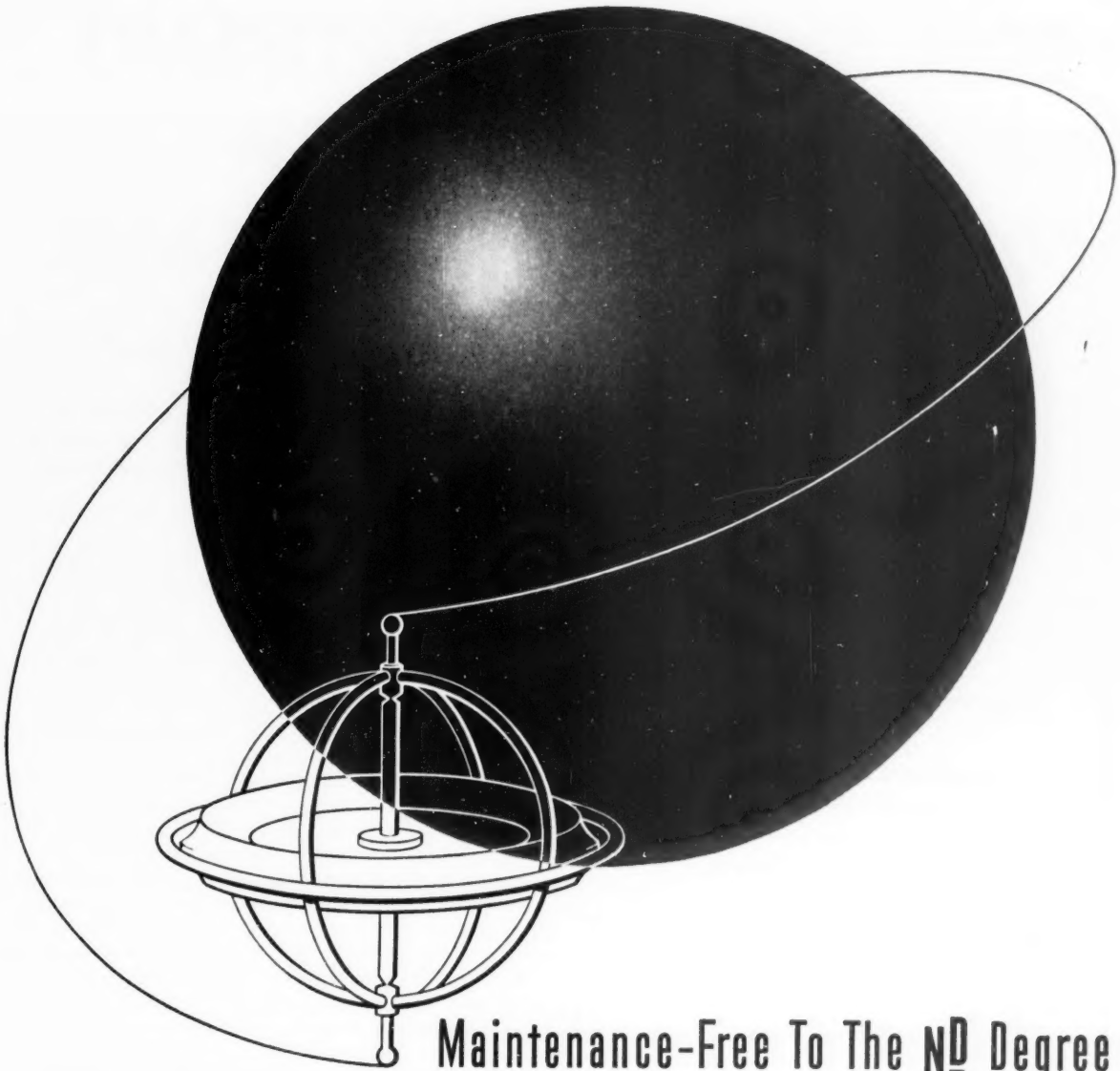
Also rumored for Indianapolis in addition to the Chrysler, Cadillac and Lincoln mills reported Mar. 23 are Studebaker and Dodge powered entries. The Studebaker engine will sport double overhead camshafts which may be slated for use on more conventional Studebaker power plants in the not too distant future. Studebaker denies it is contemplating a sports car, but with a double overhead cam engine and that European styling the temptation must be terrific. The Dodge engine, by the way, is claimed to produce 280 hp in the current racing version with little strain.

Rumor has it that the Ford Six will be bored to 240 cubic inches from 216 in 1954 models. Resulting horsepower should not be far from 125.

The French Ford *Comete* may be introduced before long as a luxury import. The car with '53 Ford and Mercury engines has been undergoing tests recently at the Ford test track.

Attempts of some automakers to lengthen their working day are meeting with surprising worker antipathy. Seems that many of the workers have jobs in other plants for the second shift and just can't make their other jobs when the quitting time is moved up on the first shift.

Hudson's Jet is still a headache for the firm. Material shortages crippling body output have knocked production down to 12 units an hour compared with 30 a short time ago.

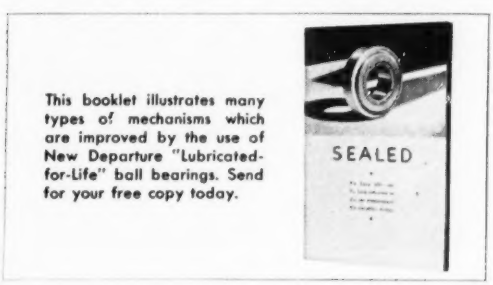


Maintenance-Free To The NTH Degree

Maintenance costs can slash deeply into profits in every manufacturing plant. One way to attack this problem is to insist on New Departure ball bearings in both production machinery and end products . . . for New Departures are capable of reducing maintenance just as surely as they reduce friction between moving parts.

Often, New Departure bearings are self-sealed and lubricated-for-life so as to eliminate *all* bearing maintenance for years. This permits machines and motors to be placed in almost inaccessible locations without servicing problems.

With the need for adjustment and lubrication eliminated, New Departure ball bearings help cut costs all along the line. Keep your eye on the BALL to be sure of your BEARINGS!



This booklet illustrates many types of mechanisms which are improved by the use of New Departure "Lubricated-for-Life" ball bearings. Send for your free copy today.

NOTHING ROLLS LIKE A BALL

NEW DEPARTURE

BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

Also Makers of the Famous New Departure Coaster Brake

TOOL STEEL THAT OUTWEARS OTHERS 3 TO 1 NOW COMES IN HOLLOW BAR FORM

ADVANTAGES OF GRAPH-MO

MOST STABLE TOOL STEEL MADE
OUTWEARS OTHERS 3 TO 1
MACHINES 30% FASTER
MINIMUM TENDENCY TO PICK UP, SCUFF OR GALL
UNIFORM RESPONSE TO HEAT TREATMENT

PLUS

ADVANTAGES OF HOLLOW BARS

NO DRILLING
FINISH BORING IS FIRST STEP
LESS MACHINING TIME
LESS SCRAP LOSS
MORE PARTS PER TON OF STEEL

EQUALS

ADVANTAGES OF

"GRAPH-MO HOLLOW-BAR"

It's "Graph-Mo® Hollow-Bar"!

NEW "GRAPH-MO HOLLOW-BAR" COMBINES THE FASTER MACHINING AND LONGER WEAR OF GRAPH-MO WITH THE ECONOMY OF A HOLLOW BAR SECTION

Now you can get Graph-Mo® graphitic tool steel in hollow bars! It's "Graph-Mo Hollow-Bar"—a new product developed by the Timken Company for makers of ring gages, dies and other ring-shaped tool steel parts.

"Graph-Mo Hollow-Bar" gives you all the proven advantages of Graph-Mo steel *plus* the economies of a hollow bar section. The hole is already there. Drilling is eliminated. Finish boring is your first step. You save machining time, cut scrap loss, get more parts per ton of steel.

Long used in bars and forgings by tool and die makers, Graph-Mo is a *different kind* of tool steel. Free graphite in its structure makes it 30% easier to machine. And the combination of free graphite and diamond-hard carbides give it unusual wear resistance. User reports prove it outwears other tool steels an average of 3 to 1!

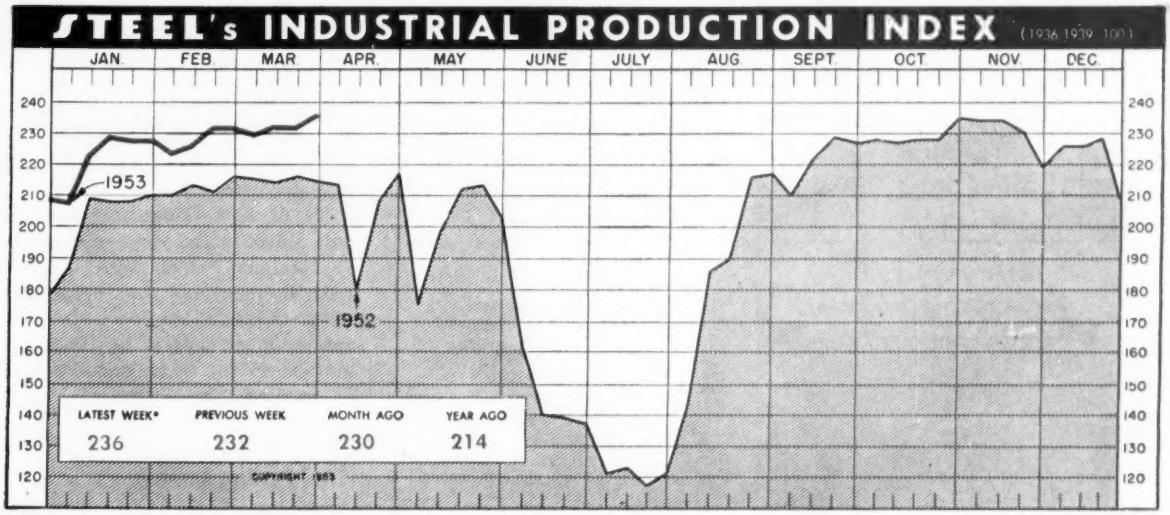
Stability tests show that Graph-Mo is the most stable tool steel made — a typical Graph-Mo steel master plug gage showed less than 10 millionths of an inch dimensional change in 12 years! Its free graphite gives it minimum tendency to pick up or gall. And it has uniform response to heat treatment.

If you make ring-shaped tool steel parts, make use of the double-barreled advantages of "Graph-Mo Hollow-Bar". Sizes range from 4″ to 16″ O. D. with a variety of wall thicknesses. "Graph-Mo Hollow-Bar" is distributed through A. Milne and Company and Peninsular Steel Company warehouses.

Get complete information today. Write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



* Week ended Mar. 28

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%.

Production machinery is whirling faster than in any period since World War II. High consumer demand is supplying a large boost. Industrial activity index jumps

THE NATION'S assembly lines are now moving faster than in any period since the all-out production weeks of World War II.

Industrial production, as measured in STEEL's index, jumped 4 points in the week ended Mar. 28 to 236 per cent of the 1936-1939 average. The 236 per cent level is 1 point over the previous postwar high established in the final week of last October when metalworking companies were striving to regain output lost by the steel strike. Indications point to a further upsurge in output during the next few weeks.

Steel—Steel production is nearly as heavy as current equipment permits, and new facilities are being installed rapidly to raise output even higher. As steel demand remains sturdy, producers are saying that high output will continue for some time ahead. Steel mills, as things look now, will continue busy well into the third quarter, at least.

Automotive production is now unusually strong and is also expected to rise some more. Customers are snapping up new models nearly as fast as they enter dealers' showrooms, and installment credit on autos is climbing at an almost unbelievably fast momentum.

Sparks Flying—Electricity generation, a good indicator of production, is now a sizzling 9-10 per cent over the comparable weeks in the spring of 1952. This over-the-year gap has widened from about 7 per cent in the fall weeks of 1952 to 9.8 per cent in recent weeks.

Freight car loadings are the one depressive factor in today's industrial picture. Revenue freight, since before the start of 1953, has fallen about 4 per cent under the comparable weeks of a year earlier. This lag is not expected to continue, however. Predictions coming in from regional advisory boards to the Association of American Railroads say that loadings in the second quarter will exceed by 8 per cent those of the second three months of 1952.

Steel Output Climbs Higher . . .

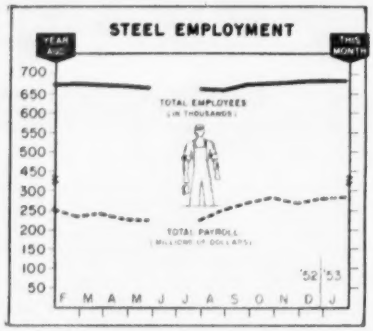
Swamped by new orders, steel companies are pouring heavier tonnages each week. The American Iron & Steel Institute says that U. S. production in the week ended Mar. 28 totaled 2,324,000 net tons of steel for ingots and castings. That's the fourth consecutive week that output records were broken. Estimated for the week ended Apr. 4 is a turnout of 2,273,000 net tons.

Laundry Equipment Soaring . . .

Among household appliances, demand is particularly encouraging for manufacturers of home laundry equipment. Reason for this is that many housewives already own modern refrigerators and ranges and are now purchasing laundry equipment. The American Home Laundry Manufacturers' Association says that factory sales of standard-size household washers in February totaled 326,604 units, or 27.6 per cent over washer sales in February, 1952. Sales of automatic tumbler dryers in February rose 28.3 per cent over the year to 57,136 units, and ironer sales totaled 22,586 units, or 28.1 per cent over a year earlier.

Auto Production Surges . . .

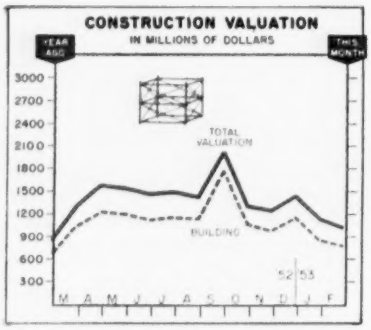
Automakers are starting the second quarter with operations running in quick-time. Production of U. S. passenger cars and trucks are at a two-year peak and an even higher weekly output may occur shortly. U. S. output of passenger cars and trucks in the week ended Mar. 28 numbered 169,379 units, or 36 per cent over the comparable week of last year and the highest weekly volume since March, 1951,



Steel Employment, Payrolls

	Employees in Thousands		Payrolls in Millions	
	1953	1952	1953	1952
Jan.	683	672	$285.4	$252.2
Feb.	...	674	....	234.9
Mar.	...	672	....	242.7
Apr.	...	670	....	225.6
May	...	662	....	223.1
June	...	*	....	*
July	...	*	....	*
Aug.	...	660	....	250.4
Sept.	...	674	....	269.4
Oct.	...	677	....	282.9
Nov.	...	680	....	269.7
Dec.	...	684	....	280.0

*Not available because of steel strike.
American Iron & Steel Institute.

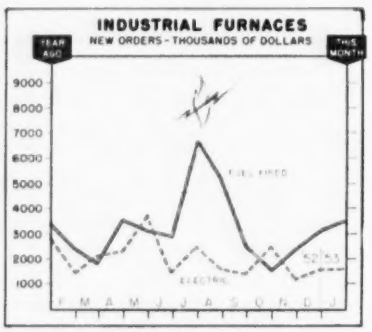


Construction Valuation

(37 States)—In Millions of Dollars

	Total		Building	
	1953	1952	1953	1952
Jan.	1,075.9	902.1	867.0	695.4
Feb.	.....	885.2	.....	697.8
Mar.	.....	1,321.3	.....	1,056.0
Apr.	.....	1,597.5	.....	1,243.9
May	.....	1,563.6	.....	1,216.2
June	.....	1,488.8	.....	1,133.3
July	.....	1,511.3	.....	1,170.8
Aug.	.....	1,438.7	.....	1,147.5
Sept.	.....	2,039.2	.....	1,790.8
Oct.	.....	1,310.1	.....	1,072.8
Nov.	.....	1,248.8	.....	989.9
Dec.	.....	1,467.4	.....	1,147.7
Total	.....	16,774.9	.....	13,362.1

F. W. Dodge Corp.

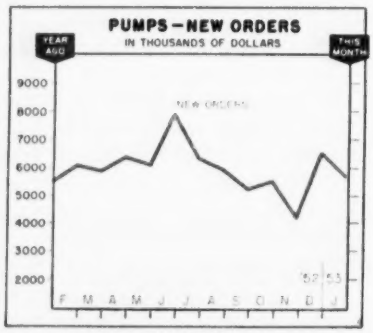


Industrial Furnaces

New Orders—Thousands of Dollars

	Fuel Fired*		Electric	
	1953	1952	1953	1952
Jan.	3,540	3,379	1,655	2,856
Feb.	....	2,413	....	1,363
Mar.	....	1,813	....	2,100
Apr.	....	3,606	....	2,298
May	....	3,032	....	3,713
June	....	2,954	....	1,552
July	....	6,728	....	2,530
Aug.	....	5,259	....	1,626
Sept.	....	2,462	....	1,412
Oct.	....	1,567	....	2,459
Nov.	....	2,382	....	1,241
Dec.	....	3,235	....	1,634

* Except for hot rolling steel.
Industrial Furnace Mfrs. Assn



Pumps, New Orders

In Thousands of Dollars

	1953	1952	1951
Jan.	5,752	5,517	6,477
Feb.	....	6,020	6,480
Mar.	....	5,925	7,654
Apr.	....	6,354	7,583
May	....	6,140	6,371
June	....	7,957	6,852
July	....	6,299	8,358
Aug.	....	5,921	5,911
Sept.	....	5,258	6,552
Oct.	....	5,534	6,506
Nov.	....	4,130	5,908
Dec.	....	6,575	5,553
Total	....	71,630	80,175

Hydraulic Institute

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Issue Dates on other FACTS and FIGURES Published by STEEL

Durable Goods	Mar. 30	Indus. Production	Feb. 16
Employ., Metalwk.	Mar. 30	Machine Tools	Mar. 23
Fab. Struc. Steel	Mar. 30	Malleable Castings	Mar. 16
Foundry Equip.	Mar. 23	Prices, Consumer	Jan. 26
Freight Cars	Mar. 23	Prices, Wholesale	Jan. 26
Gear Sales	Mar. 9	Radio, TV	Feb. 2
Gray Iron Castings	Mar. 16	Ranges, Gas	Mar. 30
Ironers	Mar. 9	Ranges, Elec.	Feb. 2
Refrigerators	Feb. 2		
Steel Castings	Mar. 16		
Steel Forgings	Mar. 16		
Steel Shipments	Nov. 3		
Vacuum Cleaners	Mar. 23		
Wages, Metalwk.	Mar. 9		
Washers	Mar. 30		
Water Heaters	Mar. 30		

says *Ward's Automotive Reports.*

Shortages of steel may not worsen as much as auto companies in recent weeks have feared. One "Big Three" producer is raising schedules, and overtime is expected to receive an increasing play. If everything goes well, says the automotive weekly, output of passenger cars and trucks in the May-June period may reach the highest level in history.

U. S. and Canadian car-truck assemblies in the week ended Mar. 28 totaled 179,909 units, up 9986 from the previous week and 47,059 units over automotive volume in the week ended Mar. 29, 1952. Production in the week ended Apr. 4 is estimated by STEEL at 177,000 passenger cars and trucks.

Tool Picture Improves . . .

The machine tool industry is finding that civilian manufacturers are pressing for equipment as defense orders for tools continue to decline. The National Machine Tool Builders Association says that new orders in February totaled $85 million or 282.2 per cent of the 1947-1949 average. That's the largest influx of orders since last September but it is well under the 318.8 index for February, 1952, and a dramatic slash from the 615.3 index of February, 1951. An encouraging factor is the drop in cancellations in February. Canceled orders amounted to not more than 10 per cent of the gross new orders received—the smallest percentage in over a year.

Productive capacity of toolmakers is continuing to expand to the highest rate in history and is well above the inflow of new orders. Defense orders for heavy equipment and the possibility of a national emergency are keeping the industry capacity on the upclimb. With shipments outpacing incoming orders, the industry has 9 months' work ahead at the present demonstrated production rate. A year earlier, the rate was 17.1 months, and in February, 1951, toolbuilders had 18 months of work lined up.

Business Looks Good . . .

Business will remain at today's high levels throughout the next three months, at least. So predicts

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	101.0	101.0	102.0
Electric Power Distributed (million kwhr)	8,050[1]	8,078	7,236
Bituminous Coal Output (daily av.—1000 tons)	1,352	1,305	1,587
Petroleum Production (daily av.—1000 bbl)	6,450[1]	6,489	6,402
Construction Volume (ENR—millions)	$344.1	$316.1	$271.6
Automobile, Truck Output (Ward's—units)	179,909	169,923	132,850
TRADE			
Freight Car Loadings (unit—1000 cars)	705[1]	701	725
Business Failures (Dun & Bradstreet, number)	188	160	164
Currency in Circulation (millions)[3]	$29,600	$29,708	$28,329
Dept. Store Sales (changes from year ago)[3]	+16%	+11%	−7%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,577	$19,452	$17,083
Federal Gross Debt (billions)	$264.7	$265.2	$258.1
Bond Volume, NYSE (millions)	$16.2	$15.9	$13.5
Stocks Sales, NYSE (thousands of shares)	9,677	9,552	6 807
Loans and Investments (billions)[4]	$78.0	$77.8	$73.9
United States Gov't. Obligations Held (billions)[4]	$31.0	$31.3	$31.9
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	181.31	181.31	171.92
STEEL's Nonferrous Metal Price Index[6]	225.1	225.1	243.6
All Commodities[7]	110.0	110.2	112.5
All Commodities Other Than Farm and Foods[7]	113.4	113.4	114.2

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1953, 2,254,459; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

the majority of industrial buyers surveyed by the National Association of Purchasing Agents. Production in March continued to grow, but at a much slower rate than in the previous two months. Many new orders flowed in to manufacturers, although for smaller quantities of goods. Industry's supply of unfilled orders declined at a slightly accelerated pace.

Decontrol of prices in March caused more strength in the price structure than has been shown in many months. Higher quotations outbalanced the lower by four to one. With few exceptions, notably copper, price increases were small percentagewise. Most buyers say the rise in prices doesn't assure a trend, as the majority of increases were tests of the new supply-and-demand market. Competition became keen in March with "Standing Room Only" in many reception rooms of purchasers.

Structurals Orders Sagging . . .

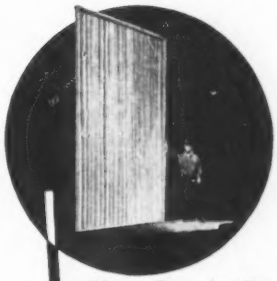
Shipments of structurals are off from a year ago as the industry faces a smaller supply of unfilled orders. American Institute of Steel Construction says that shipments in February of fabricated structural steel totaled 237,499 tons, approximately 4 per cent under February, 1952. New orders for structurals amounted to 182,184 tons, a small amount compared with the 230,832 tons ordered in the same month last year. As of Mar. 1, producers had on their books orders for 2.1 million tons, compared with 2.4 million tons a year earlier.

Foundry Equipment Slips . . .

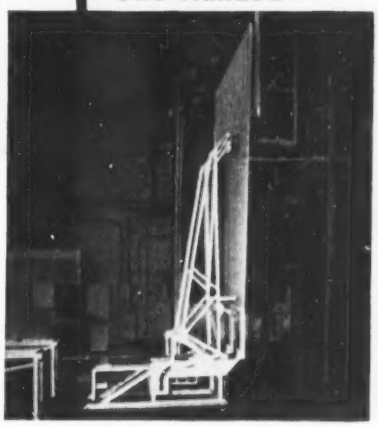
Makers of foundry equipment are experiencing a lull in new orders. The Foundry Equipment Manufacturers Association's new order index in February dropped to 257.3 per cent of the 1937-1939 average, or the lowest level in 13 months.

Trends Fore and Aft . . .

The cost-of-living declined in February to only 0.9 per cent above February, 1952, according to the Bureau of Labor Statistics . . . Department store sales in the week ended Mar. 21 jumped 16 per cent over the comparable week in 1952, but Easter came a week earlier in 1953 . . . Sales of the gearing industry rose 16.6 per cent in February . . . Contract awards for heavy construction in 1953 are now about 11 per cent over the same weeks in 1952 . . . Shipments of metal cans in January rose 15 per cent over the first month in 1952 . . . Shipments of automatic gas water heaters in February rose 30.9 per cent over February, 1952.



You Don't Toss These 500 Pound Doors Around One-Handed



Ingenious Fully Automatic Material Handling System Moves Bulky Steel Doors Safely and Efficiently Through a Production Cycle.

Each door, held in a frame by magnets, is raised from a horizontal to a vertical position then set on to an overhead conveyor and released to travel through various production processes. Finally it is removed from the conveyor and returned to the original, horizontal position—a finished product.

Every phase of the handling cycle is automatic and synchronized with every other movement.

The Door Handling Installation may not fit your material handling problems but whatever their nature the Allied Engineering Staff can provide solutions; consult us.

Allied Manufacturers Various Types of Conveyors

Floor Conveyor

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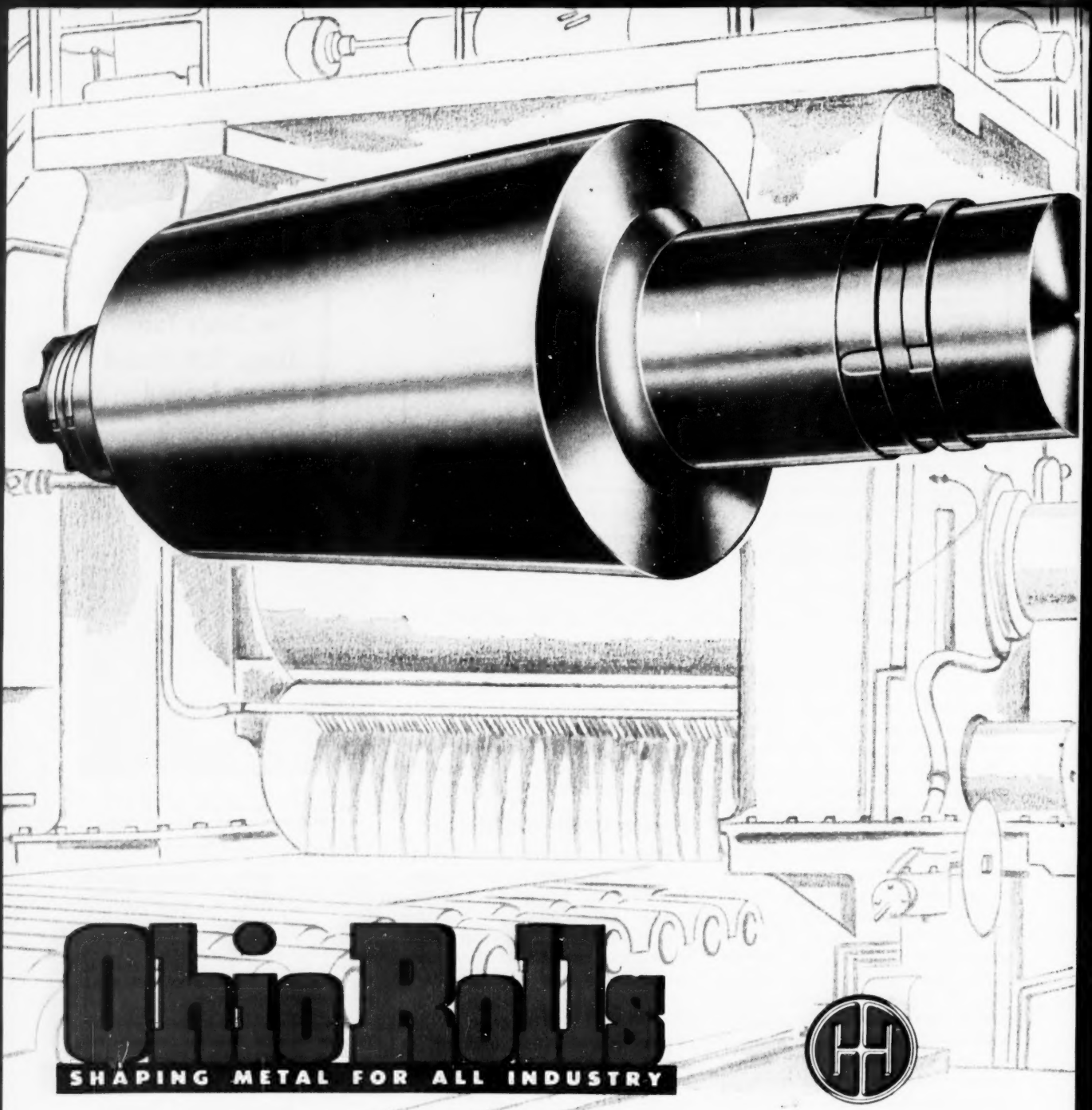

Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY

CARBON STEEL ROLLS • OHIOLOY ROLLS • OHIOLOY "K" ROLLS
HOLL-O-CAST ROLLS • CHILLED IRON ROLLS • DENSO
IRON ROLLS • NICKLE GRAIN ROLLS • SPECIAL IRON ROLLS
NIOLOY ROLLS • FLINTUFF ROLLS • OHIO DOUBLE-POUR ROLLS

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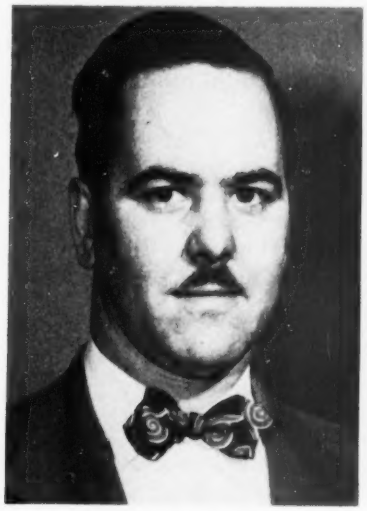
Men of Industry

WALTER B. PETERS
. . . heads new Byrne sales outlet



EDUARDO R. REDLHAMMER
. . . div. v. p. at Bart-Messing

H. B. MONTROSS JR.
. . . new position at Columbia-Geneva Steel

Byrne Metal Products Inc., Detroit, new sales outlet of Byrne Doors Inc., which maintains offices in the Curtis building at 2842 West Grand Blvd., elected **Walter V. Peters** as president. Mr. Peters formerly was executive vice president in charge of sales for Truscon Steel Co.

George W. Bruce was appointed works manager of the Claymont, Del., plant of **Colorado Fuel & Iron Corp.** Associated with the steel industry for the last 22 years, he has been associated with Midvale Steel Co., U. S. Steel Corp. and with Steel Co. of Canada as assistant works manager at Hamilton, Ont.

James L. Clifford was made New York district sales manager, **Udylite Corp.,** to succeed **A. B. Hoefer,** recently made a vice president of Udylite and an executive of Frederic B. Stevens Inc., subsidiary.

Stanley B. Lindh was appointed sales promotion manager, **Atkins Saw Division,** Borg-Warner Corp., Indianapolis. He joins the division after serving as account executive with Hugh H. Graham Associates at New Britain, Conn. He formerly was assistant sales manager for Morse Twist Drill & Machine Co., and sales and advertising analyst for Lever Bros.

Eduardo R. Redlhammer was elected vice president in charge of the Sel-Rex Rectifier Division, **Bart-Messing Corp.,** Belleville, N. J. **Sid Mitwol** becomes sales manager, same division. Mr. Redlhammer has been with the company since 1947 and formerly was chief engineer in charge of rectifier development.

Hall Kirkham has retired as president of **Hydreco Division,** New York Air Brake Co., Cleveland, and that position has been discontinued. He continues as director of and special consultant for the parent company. **Edward J. Hrdlicka,** associated with Hydreco since 1936 when that division was organized as Hydraulic Equipment Co., and most recently serving as vice president of sales, was appointed Hydreco manager.

Thorbjorn Madsen was elected vice president in charge of production, scale division, **John Chatillon & Sons,** New York. He joined the company in 1927 and has been works manager of the scale division since 1949.

Allen S. Dunbar, for the last three years senior research engineer for Stanford Research Institute, joins **Dalmo Victor Co.,** San Carlos, Calif., as assistant director of research.

H. B. Montross Jr. was made manager of market development by **Columbia-Geneva Steel Division,** U. S. Steel Corp., with headquarters in San Francisco. He joined the organization in 1947 in the Seattle sales office and since 1951 has been senior technical field representative in that area.

Dwight Palmer has retired as chairman of **General Cable Corp.,** New York, and is succeeded by **Irving T. Bennett,** who on May 1 will also be chairman of the executive committee. Mr. Bennett at present is vice president of Revere Copper & Brass Inc. On Nov. 1 he will become chief executive officer of General Cable and **James R. MacDonald,** president, will continue in that post, and will assume charge of all company operations.

Leo Botwin, senior project engineer, Sperry Gyroscope Corp., Great Neck, N. Y., has joined **Ketay Mfg. Corp.,** New York, as director of systems engineering.

Richard K. Hulett, since 1950 associated with the **Iron Fireman Mfg. Co.** Cleveland office and field engineering staff, was advanced to assistant industrial sales manager.

Alfred H. Busch was elected secretary, **Stewart-Warner Corp.,** Chicago. He has been acting secretary

GEORGE E. MILLER
. . . Osborn's machine div. sales manager

since the death of **James I. Minteer** last February.

Promotions in the machine division of **Osborn Mfg. Co.**, Cleveland, include **George E. Miller,** since 1945 assistant sales manager, now sales manager; **James W. Stuart,** sales engineer in the eastern territory, now in the Cleveland office as assistant sales manager; and **J. Doyle Robbins,** production manager, named assistant to the vice president.

Acheson Colloids Co., division of Acheson Industries Inc., Port Huron, Mich., appointed **Harold J. Dawe** technical director, **Alden Crankshaw** sales manager and **John W. Shier** production manager. Since 1941 Mr. Crankshaw has been eastern service manager, responsible for the area bounded by Buffalo, Pittsburgh and Washington. His New York and New Jersey territory is now served by **Paul E. Yoder. Earl L. Youse** is supervisor, product development laboratory.

At **Lebanon Steel Foundry,** Lebanon, Pa., **T. S. Quinn** continues as treasurer and in over-all charge of operations, but relinquishes his position of general manager to his son, **Harry L. Quinn,** also secretary. **T. S. Quinn Jr.,** assistant plant manager in charge of foundry operations, was made plant manager, and **Leroy G. Miller,** currently serving as plant manager, was named to the newly created position of chief engineer in charge of product. **John M. Quinn,** assistant plant manager in charge of casting cleaning operations, assumes the added responsibility for all foundry operations.

Frank J. Delaney, formerly with International Harvester Co., Chicago, has joined **Allied Equipment Co.,** Fresno, Calif., as sales promotion and advertising manager.

Roy C. Knoll, vice president of **Inland Steel Products Co.,** Milwaukee, has retired. He was placed in charge of the company's expansion program two years ago. He joined the company in 1937 and in 1950 was named vice president for manufacturing.

L. Richard Edgcomb was appointed manager, nonferrous sales, **Edgcomb Steel Corp.,** Hillside, N. J. Until recently he was with the Los Angeles sales office of Reynolds Metals Co.

Clark Bros. Co., Olean, N. Y., announces changes in its corporate officers. **C. Paul Clark** becomes chairman of the board and is succeeded as president by **John N. MacKendrick,** who since 1946 has been vice president in charge of engineering. **F. W. Laverty,** general sales manager, was elected executive vice president. **George W. Probst** was named vice president-sales; **Edward G. Beardsley** vice president-engineering; **Richard F. Moser** vice president-manufacturing; and **C. C. Hill** secretary and treasurer. **David K. Hutchcraft,** vice president-sales, and **Frederic H. Light,** vice president, secretary and treasurer, have relinquished their responsibilities in line with the company's retirement policies but remain as consultants.

Durando Miller Jr. was made assistant technical manager at **Permutit Co.,** New York.

Julian D. Dickerson was appointed chief metallurgist for the Midland, Pa., Works, **Crucible Steel Co. of America.** He replaces **George Bryer,** recently appointed metallurgical service engineer for the Detroit area. Before joining Crucible Mr. Dickerson was chief metallurgist for Republic Steel Corp. at its Buffalo plant.

General Electric Co. announces consolidation of its wiring device department at Bridgeport, Conn., and its Monowatt department at Providence, R. I., into a new department to be known as the GE wiring device department. Headquaters will be at Providence. **Abe F. Warren** was appointed general manager and **Arville W. Gilmore** assistant general manager. Both General Electric and Monowatt brand lines will be retained and manufacturing operations will be continued at present locations.

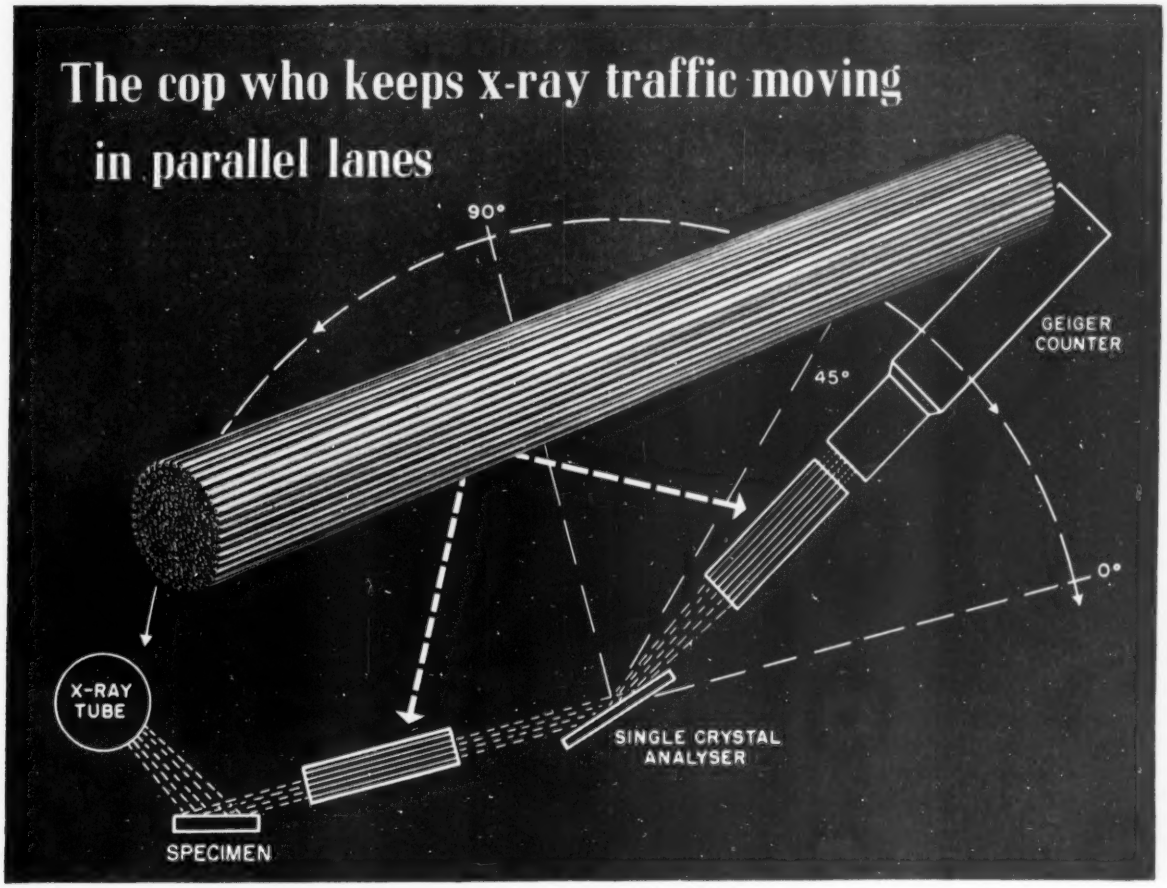
Howard Winterson was appointed director of industrial relations at **Blaw-Knox Co.,** Pittsburgh.

Joseph J. Lengyel was appointed manager of marketing for **General**

C. PAUL CLARK

JOHN N. MACKENDRICK
. . . new chairman and president of Clark Bros.

The cop who keeps x-ray traffic moving in parallel lanes



Fluorescence analysis is the new, fast way to find out which elements and how much of each are in alloys—without destroying the sample of the alloy.

This trick is accomplished by bombarding the alloy specimen with X-rays using a Fluorescence Analysis Unit produced by North American Philips, Inc. The x-radiations of each element bounce off the specimen only to be separated according to wavelength and measured.

As the x-radiations leave the specimen they shoot through bundles of fine tubes known as "collimators". The collimator acts as a kind of traffic cop, keeps the rays moving in parallel lanes, reduces divergence. This is an interesting job, and we're pleased that North American Philips chose Superior fine nickel tubing for it on the basis of its uniformity in diameter, wall thickness and finish.

Undoubtedly you have opportunities where tubing could be helpful—as a carrier, a weight-saving structural member, or as a shape that saves machining time. Look into the variety of forms, sizes, and analyses Superior produces to tight specifications. Take advantage of the experience and testing facilities that Superior brings to focus on your problem. Tell us the nature of your application and we'll send you information and a Data Memo by return mail. Superior Tube Company, 2005 Germantown Ave., Norristown, Pa.

Round and Shaped Tubing available in Carbon, Alloy, and Stainless Steels, Nickel Alloys, Beryllium Copper, Titanium and Zirconium.

Superior

THE BIG NAME IN SMALL TUBING

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. UNderhill 0-1331

All analyses .010" to ⅝" O.D.
Certain analyses (.035" Max. wall) up to 1⅛" O.D.

ORREN S. LESLIE
. . . Fairbanks, Morse v. p.-mfg.

JACK G. ALLEN
. . . joins Bingham-Herbrand

PETER G. CALVELLO
. . . Cory div. purchasing director

Electric Co.'s construction materials division, Bridgeport, Conn.

Fairbanks, Morse & Co., Chicago, elected **Orren S. Leslie** vice president-manufacturing and **G. J. Malone** vice president-controller. **J. A. Cuneo**, general sales manager of the company, was elected to the board of directors.

B. S. Handwork was elected chairman of the board of **Joslyn Mfg. & Supply Co.**, Chicago, succeeding **M. L. Joslyn**, made honorary chairman. **P. W. Lotz**, executive vice president, now is president and chief executive officer. **B. M. Smalley** becomes executive vice president.

Jack G. Allen has joined the executive staff of **Bingham-Herbrand Corp.**, Toledo, O., as a vice president of the corporation and general sales manager, Herbrand Division. He formerly was vice president, Plomb Tool Co., Los Angeles, which he joined in 1947.

Louis J. Minbiole becomes assistant sales manager, **Udylite Corp.**, Detroit. **Frank Reha** is now sales engineer in the Michigan territory.

Bruce T. Dayton was named general representative of **Douglas Aircraft Co.** for South America. He succeeds **Charles B. Cort**, transferred as Douglas parts sales representative to New York.

Peter G. Calvello was promoted to director of purchases for the **Cory Division** of Cory Corp., Chicago. **Russell A. Kawell** is director of production planning for the division.

William J. Healy, sales manager, turbine division, **De Laval Steam Turbine Co.**, Trenton, N. J., assumes the additional post of sales manager, blower and compressor division.

Robert M. Johnson was made southern California sales manager by **General Controls Co.**, Glendale, Calif.

Lt. Gen. William E. Kepner joins **Bell Aircraft Corp.**, Buffalo, as executive vice president, a new office.

OBITUARIES...

Harry W. Hill, 63, vice president in charge of operations, **Northwestern Steel & Wire Co.**, Sterling, Ill., died Mar. 23 of a heart attack. He spent his entire business career with Northwestern which he joined in 1909.

Bertram H. Lawrence, retired vice president-engineering, **United States Steel Corp.**, died at his home in Cleveland Mar. 25.

Carl E. Johnson, 69, board chairman of **Sterling Electric Motors Inc.**, died Mar. 26 at his home in San Marino, Calif.

Frederick D. Schreiber, 62, manager, coal chemicals division, **Pittsburgh Coke & Chemical Co.**, Pittsburgh, died Mar. 22 of a heart attack while vacationing in Florida.

Inland Steel Co., Chicago, announces that **John J. Davis Jr.**, Inland sales executive, and his wife must be presumed lost as a result of their disappearance at sea near the Bahama Islands a few weeks ago. Mr. Davis was manager of sales for the railroad, pig iron and chemical division.

Walter E. Blair, 63, assistant to the president, **Solvay Process Division**, Allied Chemical & Dye Corp., New York, died Mar. 23.

G. Brock LePan, president, **Gerrard Co. Ltd.**, Hamilton, Ont., wire tying machines, died Mar. 23.

Ralph W. Hisey, who retired from the **Osborn Mfg. Co.**, Cleveland, in 1945 after 32 years of service as a vice president-manufacturing for the machine division, died Feb. 16.

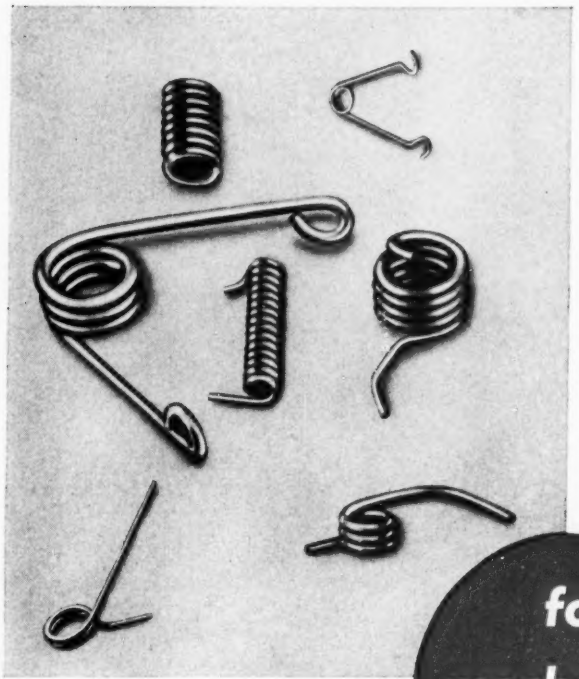
Clinton H. Havill, 60, head of the electronics research department of **Curtiss-Wright Corp.'s** plant in Carlstadt, N. J., died Mar. 25.

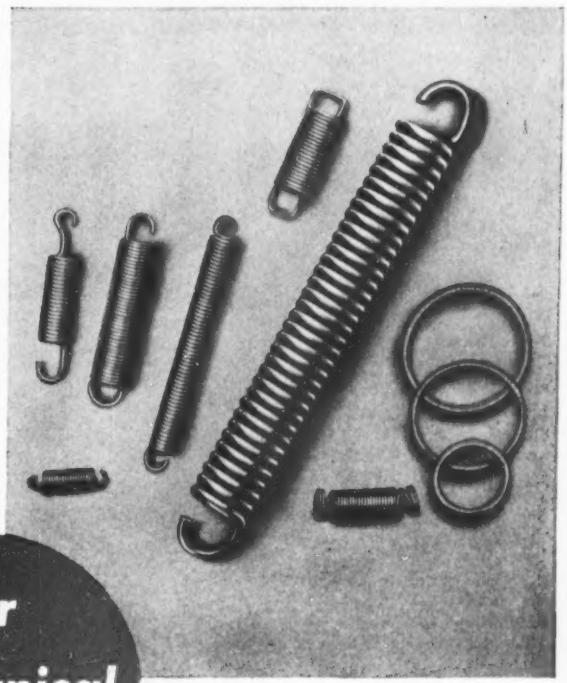
Dennis L. Fitzgerald, 59, salesman for **United States Hoffman Machinery Corp.**, New York, died Mar. 23.

E. B. W. Pfischner, president, **E. T. Lippert Saw Co.**, Millvale, Pa., died Mar. 13.

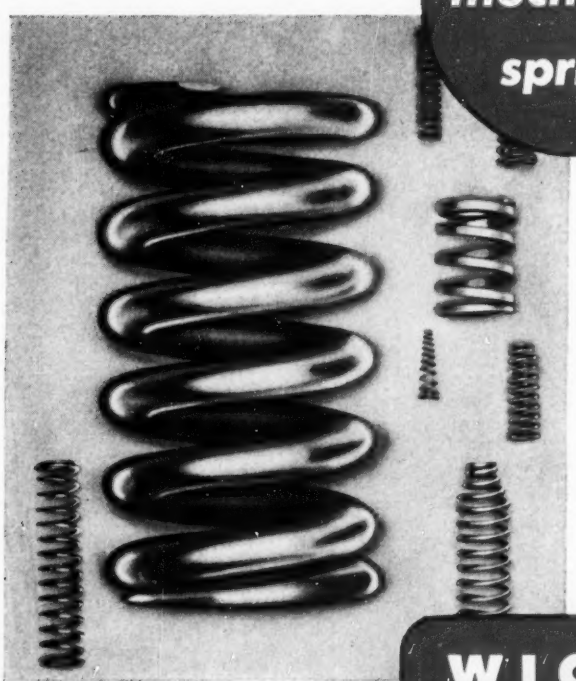
Harvey J. Rowe, 51, district manager, **Perfect Circle Corp.**, Chicago, died Mar. 23.

WICKWIRE WIRE





for mechanical springs



When you select Wickwire Wire you're always sure of wire that has the definite physical properties best suited for your particular spring application.

That's because Wickwire Wire . . . Hard Drawn, Spheroidized or Oil Tempered . . . is a product of long experience, skilled craftsmanship and completely integrated facilities starting with actual steel making. Thus, every step of its production is under constant and uninterrupted control, subject to thorough-going testing, checking and inspection.

High or low carbon steel . . . round or shaped . . . in all tempers, grades and finishes, it pays to remember—*For the Wire You Require, Check First With Wickwire.*

THE COLORADO FUEL AND IRON CORPORATION—Denver, Colorado
THE CALIFORNIA WIRE CLOTH CORPORATION—Oakland, California
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo
Chicago • Detroit • New York • Philadelphia

1.304

WICKWIRE WIRE

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

CF&I

Castings for the Connoisseur

If there were a gallery where casting works of art were displayed, there's no doubt that Sivyer castings would wear many a blue ribbon. Indeed, the most critical judging would reveal only casting perfection . . . unblemished finish . . . sharp corners . . . clean cored holes . . . absence of excess metal. Manufacturers who insist on the ultimate in steel castings know that the Sivyer Ⓢ means less handling . . . lower machining time greater dependability . . . longer service life. Look for it.

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SIVYER

SPECIALISTS IN HIGH ALLOY AND SPECIFICATION STEEL CASTINGS

SIVYER STEEL CASTING COMPANY • MILWAUKEE Ⓢ CHICAGO Ⓢ MAIN OFFICE: 1675 SO. 43rd ST. • MILWAUKEE, WIS.

Crane Enters Titanium

Chicago company seeks government contract for plant to produce 6000 tons a year

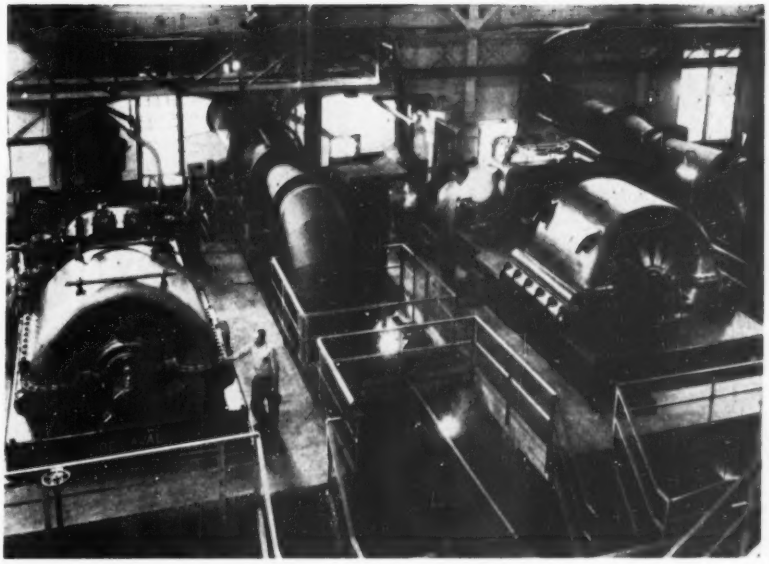
CRANE CO., Chicago, may soon become the third and largest U. S. producer of titanium. Crane is now seeking a contract with the government to build a $26 million plant to produce 6000 tons of titanium sponge annually.

After spending $1 million experimenting with the metal, Crane is confident that it can be produced at a lower cost. The proposed plant would be located near Nashville, Tenn.

Greatest Production — If Crane could reach its anticipated output, it would surpass total production last year by Titanium Metals Inc. and National Lead Co., presently the only two titanium producers.

Under the proposed plan, the government will lend Crane the money with which to build its plant. In return, the U. S. would have first call on titanium produced for a given number of years.

Location Uncertain—The Tennessee site was chosen because it is near a source of low-cost electric power. Other locations, however, are still being considered.



Long Life for Turboblowers

Turboblowers at Dravo Corp. enjoy a long career. In the Pittsburgh company's machinery division, one turboblower, installed for Carnegie Steel Co., was put in place 25 years ago. Recently Dravo added the second one, at right, for Sharon Steel Corp. Both blowers are 7000-horsepower units. They were produced by De Laval Steam Turbine Co., East Trenton, N. J., a firm represented by Dravo

GE "Park" Takes Shape

General Electric Co.'s Appliance Park is 35 per cent complete. Intended as a factory with a "campus atmosphere," the project is located on a 1000-acre tract in Buechel, Ky. Eventually, GE plans to manufacture all the company's refrigerators, home freezers, electric ranges and other large electric appliances there.

When completed, the project will have cost GE about $200 million. Construction, which began last year, will include five large manufacturing buildings.

Breaks Ground in Toledo

Electric Auto-Lite Co. broke ground for a new Toledo, O., plant.

Hart To Represent Buggie

Hart Engineering & Sales Co., Atlanta, became representative in Tennessee, Georgia, Alabama and Florida for H. H. Buggie & Co., Toledo, O. The Toledo company makes connectors and component parts for the electronics and communications industry.

Air Products Breaks Ground

Air Products Inc. broke ground for the first unit of a research laboratory in Allentown, Pa. The unit is the first of six which will comprise Air Products' research department. The firm produces oxygen-nitrogen generators and equipment employing extremely low temperatures, to be used in chemical and petroleum industries.

Acquires Milwaukee Company

Neff, Kohlbusch & Bissel Inc., Chicago, purchased Stokerunit Corp., Milwaukee, producer of boring and production machines, planer mills and stoker unit transmissions. Stokerunit will be known as Simplex Machine Tool Co.

H & B Hopeful for '53

H & B American Machine Co., Chicago, presented an optimistic picture of anticipated sales and profit for three new divisions established in the past year. Company spokesmen estimated that total sales this year would exceed $14 million.

Distributes Sightmaster Rods

Factory Products Corp., Chicago, entered a five-year agreement to distribute fluxless welding rod manufactured by Sightmaster Corp., New Rochelle, N. Y.

Linde Expansion Begun

Linde Air Products Co.'s research laboratory in North Tonawanda, N. Y., started a $350,000 expansion program. A two-story engineering building is under construction.

Warehouse for American Can

American Can Co. will begin construction of a new warehouse at its Geneva, N. Y., machine shop soon. The structure will have about 61,450 square feet of floor space.

Completing Building Program

A building program, started in 1946, which will add 180,000 square feet to the manufacturing plant of Crouse-Hinds Co., Syracuse, N. Y., will be completed this year. The final phase of building, construc-

ELECTRO DYNAMIC

Extra dependable industrial motors

1 TO 250 HORSEPOWER (N.E.M.A. STANDARDS)

One-piece cast iron frames.

Extra large "free-flo" air channels.

Permanently aligned cast iron brackets.

Liberal size grease lubricated bearings.

HEART of the motor

3. *Extra high-frequency testing* of insulation between turns.

4. *Extra care* in fitting coils into stator.

The WINDING is the

1. *Extra insulation* in stator slots and between phases.

2. *Extra impregnations* and bakings of the wound stator.

QUALITY SINCE 1880

WRITE TODAY FOR NEW ILLUSTRATED CATALOGUE NO. 468

Also a complete line of Direct Current motors and generators

ELECTRO DYNAMIC

DIVISION OF GENERAL DYNAMICS CORPORATION

BAYONNE, NEW JERSEY

Simulated Stops

When a driver stops his car, he seldom generates more than 260 pounds per square inch of pressure on the brake line. But this machine, which tests power brakes at Chrysler Corp., puts as much as 1400 pounds per square inch on the line, and each brake must withstand 500,000 stops. Some have gone up to 1.5 million

---

tion of a 45,000-square-foot foundry, is to be finished by fall.

Chris F. Neely Promoted

Chris F. Neely was made staff engineer of the Liquefied Petroleum Gas Association Inc. and will devote his time to technical and safety activities.

To Move Warehouse

Bridgeport Brass Co., Bridgeport, Conn., is moving its New England warehouse facilities at Providence, R. I., to a new location at 177 Georgia Ave.

Names Chicago Agent

Lees-Bradner Co., Cleveland, precision thread milling machine manufacturer, appointed Charles Ross Co., Rockford, Ill., as sales representative in the Chicago area.

Instrument Building Begun

G. M. Giannini & Co. is building a new scientific instrument assembly building in Pasadena, Calif. Giannini designs and makes precision instruments for guided mis-

Are high capacity and long service life important?

here's how truck and trailer manufacturers get them with NEEDLE BEARINGS

Many leading truck and trailer manufacturers specify Torrington Needle Bearings for steering and brake assemblies because of their high radial load capacity and their long service life.

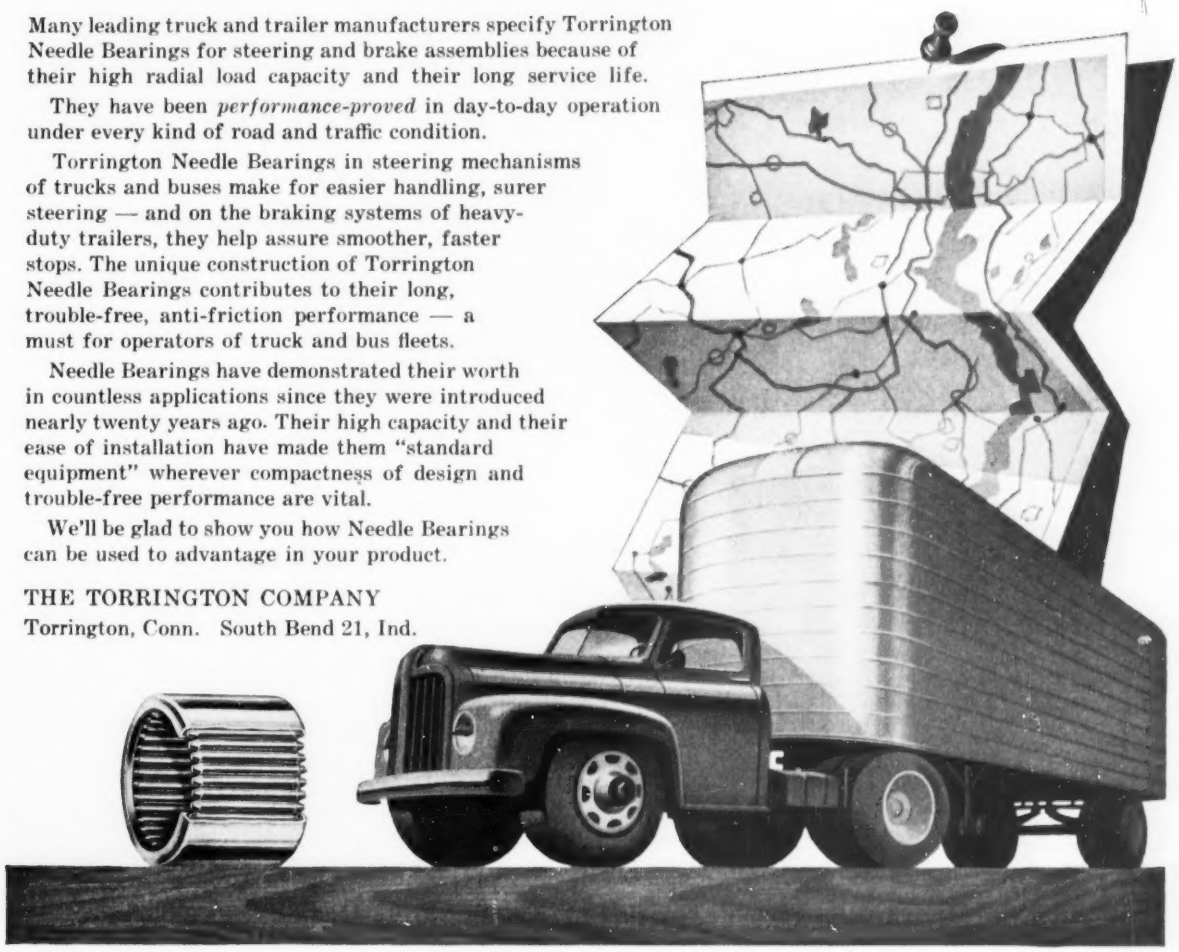
They have been *performance-proved* in day-to-day operation under every kind of road and traffic condition.

Torrington Needle Bearings in steering mechanisms of trucks and buses make for easier handling, surer steering — and on the braking systems of heavy-duty trailers, they help assure smoother, faster stops. The unique construction of Torrington Needle Bearings contributes to their long, trouble-free, anti-friction performance — a must for operators of truck and bus fleets.

Needle Bearings have demonstrated their worth in countless applications since they were introduced nearly twenty years ago. Their high capacity and their ease of installation have made them "standard equipment" wherever compactness of design and trouble-free performance are vital.

We'll be glad to show you how Needle Bearings can be used to advantage in your product.

THE TORRINGTON COMPANY
Torrington, Conn. South Bend 21, Ind.



TORRINGTON *NEEDLE* **BEARINGS**

Needle • Spherical Roller • Tapered Roller • Straight Roller • Ball • Needle Rollers

Trade-marks of some of the truck and trailer manufacturers whose products enjoy the benefits of Needle Bearings.

Sterling White · International · Ford · Dodge · LaCrosse · Trailmobile · Mack Trucks · Kingham

JOHNSON

HIGH QUALITY HIGH CARBON WIRES

When the second man appeared on earth, the rights of the first were cut in half. Now divide yourself by the total population and that explains everything.

We do not claim the know-all of the wire making business, but we have been associated long with the men of this great wire making center*—and from many of these wire men have come suggestions that have led to improvements in manufacture all the way from rod to finished product.

*Worcester is the cradle of the American wire drawing industry.

JOHNSON STEEL AND WIRE COMPANY, INC.
WORCESTER 1, MASS.
New York Philadelphia Cleveland Detroit Akron Chicago
Atlanta Houston Tulsa Los Angeles Toronto

SUBSIDIARY OF PITTSBURGH STEEL COMPANY

siles, radar control and industrial applications.

Caspers Buys Zahn

Caspers Tin Plate Co., Chicago, purchased the Zahn Steel & Lithographing Co., Santa Clara county, Calif. Caspers will operate the Zahn firm as a wholly-owned subsidiary.

Portion of Business Sold

Pesco Products Division of Borg-Warner Corp. sold Pesco's supercharger business to Dexter Folder Co., Pearl River, N. Y.

Modernization for A-C

Allis-Chalmers Mfg. Co. announced a $3 million plant modernization and expansion program for additional machine tools and testing at the company's West Allis, Wis., works. The project includes a new steam turbine, installation of a new boiler, rebuilding of the main substation and modernization of the coal handling system.

Hanna Opens Plant

Hanna Steel Corp., Birmingham, established a steel processing plant and warehouse in that city to furnish package lots or carloads of steel sheets and strip. The plant will occupy 50,000 square feet.

Vapor Plans Factory

Vapor Heating Corp. will build a $2 million factory and office building in Niles, Ill. The structure, to be completed next January, will contain 218,000 square feet. About 800 persons will be employed.

Joins Chain Group

Round Chain Companies, a group of 11 affiliated firms, established a Canadian affiliate, Round Chain Co. of Canada, Brampton, Ont.

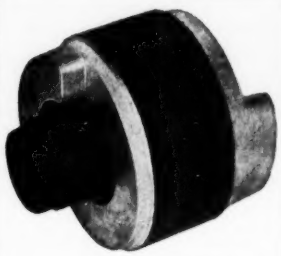
New Building for Lindberg

Lindberg Steel Treating Co. is building a heat treating plant in Chicago. When completed, the project will double Lindberg's present capacity of 12,500 tons of metal annually. Plant cost will be $1

Closer Temperature Control, Cleaner Aluminum, Cooler and Less Congested Conditions Are Obtained With

AJAX TAMA-WYATT *Induction Furnaces*—

Thousands of die cast rotors for hermetic motors are made from pure aluminum poured from a battery of AJAX Electric Induction Furnaces installed in the St. Louis plant of the Emerson Electric Mfg. Co. Two of these furnaces are shown in the photograph at right.



Close-up of die-cast aluminum rotor which is pressed onto the compressor shaft extension used in refrigeration units.

Our electrical industry produces fractional horse power motors at the rate of 20 to 25 millions per year. After World War II the leading manufacturers changed from fabricated copper rotors to cast aluminum rotors. In this operation, aluminum of high purity under closely controlled temperature is required. In many cases the machines had to be placed right on the assembly line, with severe space restrictions and, of course, with rigid requirements for reliability. AJAX induction furnaces and AJAX automatic pouring units were selected for this job in almost all the plants which switched from copper to aluminum rotors.

Write for Further Information to

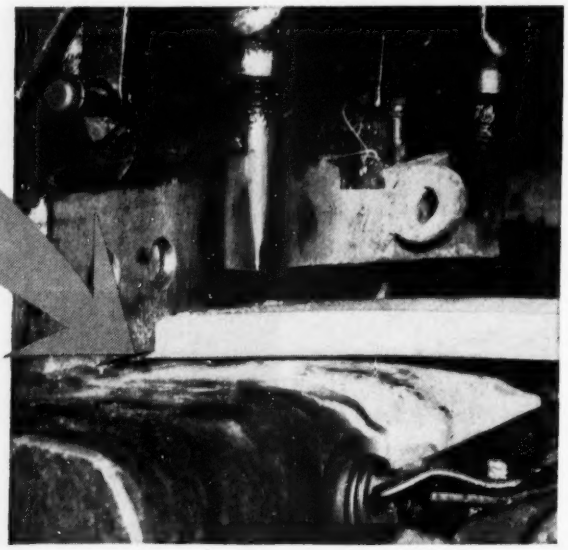
AJAX ENGINEERING CORPORATION, TRENTON 7, N. J.

AJAX TAMA-WYATT = **INDUCTION MELTING FURNACE**

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting

HOT SHEAR BLADES STAY SHARP...when Hard-Faced with HASTELLOY Alloy C
TRADE-MARK

A 3/32-in. deposit of HASTELLOY alloy C on the cutting edge of this shear blade has increased its life by four times. The edge can be rebuilt again and again, when it finally does wear.



This shear blade is used in a plant producing tough non-ferrous alloys. Before hard-facing was adopted, the blades would chip, lose their edge, and have to be scrapped after shearing only about 50 tons of metal. They now can handle roughly four times that amount of metal because they are protected with HASTELLOY alloy C. They can be machined and hard-faced again when they finally do wear. One set of hard-faced blades has been in use in the plant for more than three years with periodic maintenance.

In steel mills, too, HASTELLOY alloy C has increased the life of blooming mill shears by as much as 10 times. Hard-faced blades have lasted 110 turns without maintenance.

HASTELLOY alloy C rod has also been applied to many other hot-working parts with outstanding success. The metal flows well by metallic arc welding or HELIARC welding without preheating. No peening is necessary. Deposits of HASTELLOY C work-harden in service. They can be machined by conventional methods.

For information on how to apply HASTELLOY alloy C to hot-working parts, write for a copy of "HAYNES Hard-Facing Manual." For on-the-job help in applying the rod, get in touch with the nearest District office.

HAYNES *alloys*
TRADE-MARK

Haynes Stellite Company
A Division of
Union Carbide and Carbon Corporation
UCC
General Offices and Works, Kokomo, Indiana
Sales Offices
Chicago — Cleveland — Detroit — Houston
Los Angeles — New York — San Francisco — Tulsa

"Haynes," "Hastelloy" and "Heliarc" are trade-marks of Union Carbide and Carbon Corporation.

New Butyrate Developed

Eastman Chemical Products Inc., New York, plans to compete with nitrocellulose in metal lacquers with a new butyrate. Nitrocellulose is one of the finishing industry's principal raw materials, but Eastman believes that spraying lacquers made of butyrate show a greater color stability and greater resistance to weathering

million, with a similar sum to be expended for equipment.

To Hold Gas Clinic

The American Gas Association is conducting an industrial gas school in Detroit for five days beginning May 4. Experienced men from utility companies, equipment manufacturers and members of industrial organizations will lecture. Meetings will be held at Detroit's Sheraton-Cadillac hotel.

Appoints Sales Engineers

American Flexible Coupling Co., Erie, Pa., appointed Paddon Co., Youngstown, as sales engineers in eastern Ohio and western Pennsylvania. American Flexible produces power transmission equipment.

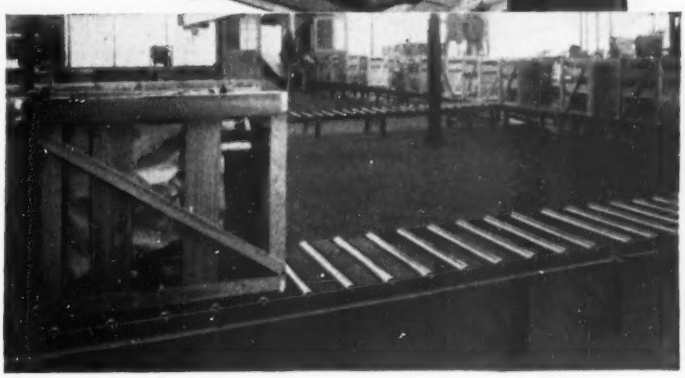
Becomes West Coast Agent

C. A. Pafenbach & Co., Los Angeles, is now West Coast agent for Lavallee & Ide Inc., Chicopee, Mass.

New Milwaukee Office

Ehret & Kinsey, Chicago representative of American Flexible

Do you pack and handle your product in crates?



Whatever you make, pack or handle, STANDARD CONVEYORS can speed operations

Material handling often constitutes as much as 50% of total production cost — cut handling costs and you cut production cost.

More than 45 years' experience qualifies Standard to be of expert service on any "package" conveyor need — roller, belt, slat, chain, push-bar, sectional, portable self-contained conveyor units — spiral chutes — pneumatic tube systems. Write —

STANDARD CONVEYOR COMPANY
General Offices: North St. Paul 9, Minn.
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Write Dept. ST-43 for Standard's General Catalog and tell us what you want to convey. Address Dept. ST-43

ROLLER • BELT • SLAT • CHAIN • WHEEL
PUSH-BAR • SECTIONAL
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HANDIBELT • HANDIPILER
INCLINEBELT • LEVEL BELT • EXTENDOVEYOR
UTILITY BELT-VEYOR • HANDI-DRIVE
VERTICAL LIFTS • PNEUMATIC TUBE SYSTEMS

Design for Economy...

with Stampings by Geometric

To a large extent the cost of your product is determined right on the drawing board. In designing new products or redesigning old ones don't overlook the cost-saving advantages of metal stampings. Many progressive manufacturers have cut cost of component parts up to 75% by converting from castings to stampings. Savings of 50% are common.

Geometric engineers, skilled in the analysis of all kinds of stamping problems are glad to show you how your product, or parts of it, can be made better, lighter and at much lower cost in our modern high-production stamping plant. You get another efficient manufacturing department for your business — without overhead expense or operating worry.

It pays you to send your blueprints for quotation—today.

GEOMETRIC STAMPING CO.

A Subsidiary of Barium Steel Corp.

1130 E. 200th Street Cleveland 17, Ohio

Coupling Co., opened a new Milwaukee office.

Relocating in Pittsburgh

York Engineering & Construction Co. and York-Gillespie Mfg. Co., Pittsburgh, relocated all their fabricating shops, machine shops, general offices and engineering departments in one large Pittsburgh plant.

Suggestions Well Received

Westinghouse Electric Corp. paid $144,057 to 8346 employees in 1952 for suggestions to improve company operations. Last year 24,750 suggestions were submitted by 10,970 workers.

Lassman Opens New Plant

Benjamin Lassman & Son opened new facilities in Glenshaw, Pa., including a manufacturing plant and offices.

I. F. Kinnard Honored

I. F. Kinnard of General Electric Co., West Lynn, Mass., won the 1952 Lamme Gold Medal award, presented to members of the American Institute of Electrical Engineers who have shown meritorious achievement in development of electrical apparatus or machinery.

Moves Permutit Office

Permutit Co., New York, manufacturer of industrial and household ion exchange equipment, will remove its Los Angeles sales office to Glendale, Calif.

Norton Finishes Factory

Norton Co., Worcester, Mass., completed a factory and office building as part of its $6 million expansion project. Norton produces 45 types of precision grinding and lapping machines.

To Lease Chlorine Plant

A chlorine plant at Muscle Shoals, Ala., will soon be available for lease to private industry, the Department of the Army says. Construction of the plant was com-

UDYLITE FULL AUTOMATIC CROSSES OFF REJECTS . . .

at the Dura Company of Toledo!

"Thousands and thousands of window regulators for automobiles go through the Dura Company Zinc Plating installation. Our Udylite Full Automatic practically eliminates rejects."

But that's only part of the Dura Company story. With their Udylite Full Automatic they get high production runs, too. This means a quality product at rock-bottom cost. It's easy to see that Udylite equipment is paying off for this modern, progressive company.

Why not bring YOUR plating problem to Udylite. Let us show you how Udylite equipment, research and supplies can give YOU top results. Call your Udylite technical man today or write direct. There's no obligation. THE UDYLITE CORPORATION, DETROIT 11, MICH.

PIONEER OF A BETTER WAY IN PLATING

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

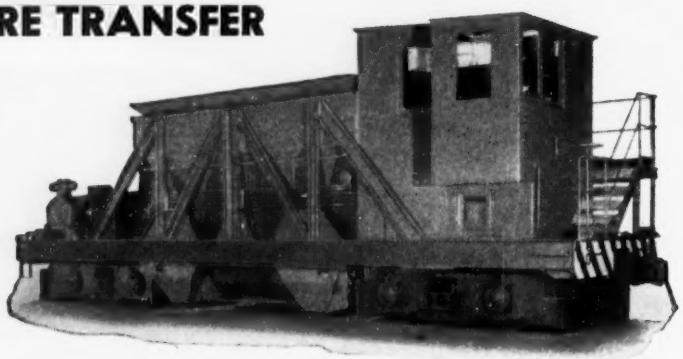
DEPENDABILITY TO SATISFY

RECORD DEMANDS

ATLAS CARS

Atlas Cars for steel plants are known to have that extra work factor which is so important in these days of high production.

50-TON BOTTOM DUMP ORE TRANSFER



This 50-ton ore transfer is a modern air-operated car with a heavy slab truck to protect motors and brakes when plowing through ore piles. For added safety a folding car pusher arm is used and is provided with a safety latch which cannot be lowered unless the switchman holds the latch. The overhung cab allows a clear line of vision for the operator.

Special features include electric hopper heaters, centralized lubricating, roller journal bearings, air brakes and, of course, all necessary safety features.

Custom Builder of Steel Plant Cars

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

Fiery Furnace at CF&I

In a fiery scene, a sample of iron is taken from a cast at blast furnace "Y", at Colorado Fuel & Iron Corp.'s Wickwire Spencer Steel Division plant in Buffalo. Here merchant pig iron is one of the major products. As iron pours from the furnace, the "binman" dips samples from the runner, pours them into small moulds to be analyzed

pleted last year, and it has since been held on a stand-by basis.

Phoenix Office Opened

Norman S. Wright & Co., West Coast distributor of toggle clamps produced by Detroit Stamping Co., established an office with warehouse facilities in Phoenix, Ariz., to serve the Southwest.

Names New Representative

G. A. Gray Co., Cincinnati, appointed Harrington-Wilson-Brown Co., New York, as eastern New York representatives.

Plans California Meeting

The Anti-Friction Bearing Distributors Association will hold a two-day meeting in San Francisco beginning Apr. 23, at the Sir Francis Drake hotel.

Purchases Instrument Maker

William Miller Corp. was acquired by Transformer Engineers, both of Pasadena, Calif. The new company, William Miller Instruments Inc., will continue to manu-

BAY STATE MOUNTED POINTS and WHEELS

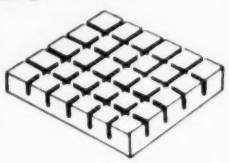
INDICATOR ACCURACY

Best because:

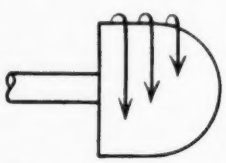
You get . . .

UNIFORM, SAFE, PRECISE PRODUCTION

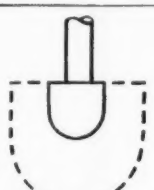
1. UNIFORM



2. SAFE



3. ACCURATE



4. DURABLE

1. Made from solid blocks of perfectly mixed materials.
Result: Complete elimination of "hard and soft" spots.

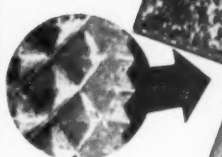
2. Deep-knurled, high strength alloy steel spindles, and special adhesive.
Result: Abrasive heads stay on spindles.

3. Each wheel trued and shaped after mounting on its spindle.
Result: Perfectly concentric; ready to use when you get it.

4. Completely uniform structure; pre-tested, positive bonding.
Result: Longer useful life; use them right down to the spindle.

Precision Shaped

on the spindle for perfect contour and complete concentricity.



Deep-Knurling

for EXTRA SAFETY, in high-strength alloy steel spindles. THE HEADS STAY ON!

Specially Cemented

USE THEM . . . right down to the spindle!

Wrench-and-vise test proves its strength. This cement HOLDS, under EXTREME STRAIN.

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WIDE RANGE OF SHAPES & SPECIFICATIONS AVAILABLE FOR IMMEDIATE SHIPMENT

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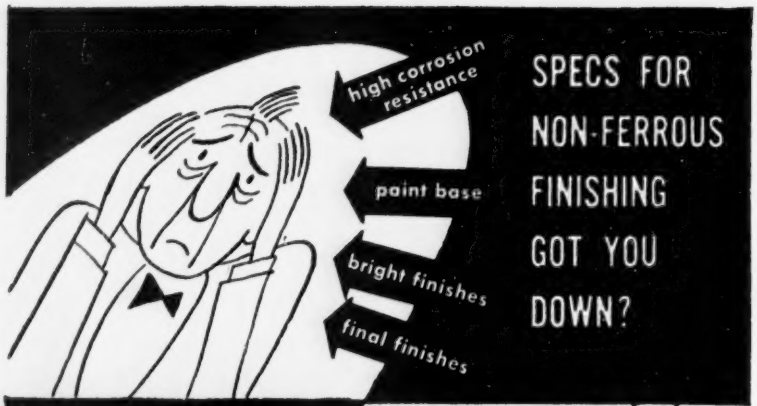
Branch Offices and Warehouses:
Chicago, Cleveland, Detroit, Pittsburgh
Distributors — All Principal Cities
In Canada: Bay State Abrasive Products Co. (Canada)



IRIDITE

WANT CORROSION RESISTANCE? Iridite will give you better-than-specification protection against corrosion.

WANT PAINT ADHERENCE? Iridite provides a firm and lasting base for paint by preventing under-film corrosion.

WANT EYE-APPEAL? Iridite can give you a variety of finishes, depending upon the metal being finished . . . from clear and sparkling bright or military olive drab, to attractive dyed colors.

BEST OF ALL, any Iridite finish is economical and easy to apply.

IRIDITE

Simple chemical dip; immersion time only 10 seconds to 2 minutes; no sealing dip; color is clear or yellow depending upon your requirements; salt spray resistance equivalent to 20 to 30 minutes of anodizing, eliminates need for costly racks and electrical power.

ALLIED RESEARCH PRODUCTS
INCORPORATED
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facture the Miller line of recording oscillographs and equipment used for measurement of vibration, pressure and strain.

Seaboard Springs Move

The Seaboard Spring Coil Corp., division of Associated Coil Spring Co., New York, will move to a new factory in Gardena, Calif., from its present Los Angeles location.

Sales Office Moves

Granite City Steel Co.'s Dallas sales office will move to new quarters at 3200 Maple Ave. Transfer was made to provide room for additional personnel.

Centers Output in Utica

General Electric Co.'s radio receiver manufacturing is now centered in its Utica, N. Y., plant, officials report.

Hanna Sells Three Ships

M. A. Hanna Co. sold three ships, the steamers *La Belle, W. D. Crawford* and *Joseph Wood.* The *La Belle* was purchased by Kinsman Transit Co., *W. D. Crawford* was acquired by Midland Steamship Line Inc., and Gartland Steamship Co. bought the *Joseph Wood.*

New Chilean Representative

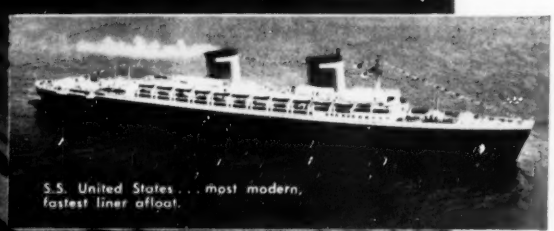
De Laval Steam Turbine Co., Trenton, N. J., named Foram Chilena of Santiago, Chile, as exclusive Chilean representative.

To Build Experimental Station

The Bureau of Mines awarded a construction contract to Nomellini Construction Co., Stockton, Calif., for an experimental station in rare and precious metals at Reno, Nev. Research will center about the rare earth minerals.

Combine Ohio Operations

Firth Sterling Inc., tool and specialty steel producer and A. Milne & Co., distributor of solid and hollow tool steels, combined their Ohio operations. Stocks of both companies' brands of steel will be distributed from A. Milne's warehouses in Cleveland, Pittsburgh and Dayton, O.



S.S. United States . . . most modern, fastest liner afloat.

America's finest!

A statement from
a conservative organization:

"Our records show that when a manufacturer once discovers the uniform quality of Roebling flat spring steel, he becomes a steady Roebling customer."

You, too, *pay* for the best spring steel . . . make sure you *get* it. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

ROEBLING

A subsidiary of The Colorado Fuel and Iron Corporation

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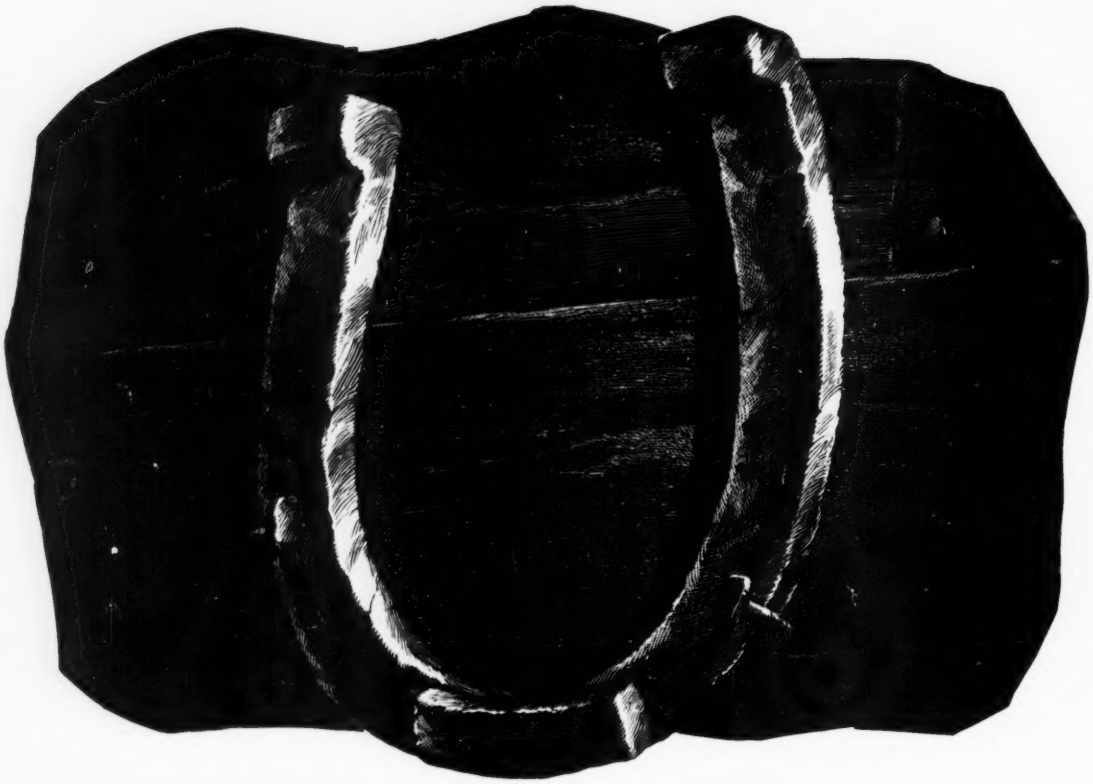

Does a Horseshoe Bring Luck?

Grandpa set a lot of store by the horseshoe over his barn door. Often the only formal opening ceremony for businesses of Grandpa's day, was the ritual of nailing a horseshoe over the entrance. But businessmen today know that "luck" is a combination of careful planning and hard work.

Of course, some mustache-cup thinking, like the horseshoe idea, has carried over into our time. The idea that certain metal items must always be cast, or always cut from solid, has persisted largely because of tradition. Many products, now handicapped sales-wise by their appearance and weight, can be made handsomer and less expensively on modern stamping presses.

Clearing Machine Corporation has kept in step with the times in showing manufacturers the way to improved methods of press production. If you manufacture volume quantities of identical items, Clearing engineers may be able to help you boost production and cut costs. This service is yours at no expense. Why not get in touch with us today?

CLEARING MACHINE CORPORATION

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HAMILTON DIVISION, HAMILTON, OHIO

CLEARING PRESSES THE WAY TO EFFICIENT MASS PRODUCTION

Production and Engineering NEWS AT A GLANCE

LICENSED DESIGN—The new Spiramatic spindle head transmission design which DeVlieg Machine Co., Detroit, is putting on their jigmills has been licensed to four other machine tool builders. Machines considered for the head are turret lathes, milling machines, radial drills and engine lathes. Spiramatic head incorporates single helical gears operating in constant mesh. All speed changes are carried out automatically through the operation of a single pushbutton.

TOUGH FIGHT—There can be no let up in the fight against corrosion, the stakes are too high. This year, for instance, industry's bill for rust and corrosion losses will be $6 billion. Little consolation can be gained from the thought that the figure could be higher. Not all the losses can be eliminated but there are ways to minimize the tendency of metals to revert to their ores or to compounds of lower energy levels. Much is being done by specialists in corrosion to cut the staggering losses incurred but many companies aren't aware of the weapons available for the fight. No company can afford to take the stand that corrosion losses are inevitable so why fight them. There are techniques and products to protect your plant and the products you sell. It's an area where a little investigation is liable to pay big dividends. p. 102

ANOTHER USE—Silicone material is being thinned to a fluid paste and marketed as a weld-backing compound. Painted on joints before welding, it promotes uniform weld penetration and eliminates the harmful effects of air on the underside of welds. It is suggested for all arc welding processes except automatic inert arc where argon is used as the shielding gas. General Electric Co. says the new compound overcomes many of the disadvantages of fluxes, metal and gas backing media. Application to complex parts is easy and the powder residue left after welding can be quickly removed with a cloth. Because it promotes no carbon pickup in the weld, it is useful in the welding of low carbon stainless steels.

PLASTIC ALLOY—That's what United Chromium calls its new 218X plastisol coating. When the plastisol, which consists of small particles of vinyl resins in liquid plasticizers, is heated to the right temperature, the resin dissolves in the plasticizer. On cooling, a rubber like material is formed which might be called a plastic alloy in the same sense that brass is an alloy formed by dissolving pieces of zinc in molten copper. Outstanding property: High resistance to chemicals. However, uses have spread far from the original use on plating racks. One plating plant extended use of the material to covering hooks on conveyors so that polished tubes wouldn't be scratched on the way to the plating department. Another uses it for coating handles of electrical tools. An automaker puts the plastisol coating on fenders and body hoisting hooks and cables, conveyor hooks and racks, spot welding machine connectors and bumper protectors. Material handling baskets are coated to prevent scratching of aluminum alloy parts for automatic transmissions. The plastic alloy is not only corrosion resistant but is thick and tough. This accounts for such varied uses as coating the inside of ventilating ducts, blades of fans, solution agitators, refrigerator trays, dishwasher racks and drain boards.

STAINLESS WELDS—Troubles often encountered in welding stainless steels can be minimized by exercising the proper regard for the metal's peculiarities. There are several ways to overcome carbide precipitation, the chief headache encountered in welding austenitic stainless steels. Welding the straight chromium grades poses additional difficulties. Carbide precipitation is not a factor but other fabrication problems make chromium stainless steels less desirable for welding than the chrome-nickel types where a choice can be made. An explanation of the effects of welding heat and a discussion of how these effects can be overcome or minimized for both stainless types offers practical assistance to plants engaged in welding stainless. p. 138

FINDING DATA—Before a research man undertakes a study, he must first find out what has gone before. Doing so is sometimes an almost impossible job since about 60 million pages of technical matter are published annually. Battelle Institute's new information service is aimed at streamlining this operation. Tailored to meet individual needs, the service will include the preparation of bibliographies, and coding and classification systems. Development of information processing equipment will be undertaken where required. Director Clyde Williams says some estimates put the current cost of literature searching at $300 to $750 million or from 10 to 25 per cent of the $3 billion spent on research last year.

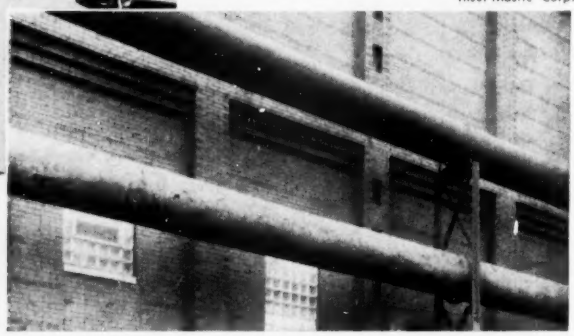
METALWORKINGS—Design features of a new aluminum extrusion press permit its installation with minimum floor space requirements and at the same time give it maximum rigidity. A swinging arm simplifies die change (p. 137) . . . Most metalworking plants use wire slings but not all of them are aware of what factors should determine the type best suited to the job. An expert gives a few simple hints on what slings are best suited to certain jobs (p. 140) . . . Increased consistency and uniformity of the cutting operation and savings in machining time are possible with a hydraulic roll lathe being installed in the Fairless Works (p. 142) . . . Concluding installment in an appraisal of present day blast furnace practice and the challenge of other designs (p. 146).

Metalworking Outlook—p. 51 *Market Outlook—p. 163*

Minimum thickness standards for paint coatings are important for lasting corrosion protection. This instrument measures thickness on sheet metal

Top pipe was coated with mastic composition three years ago; bottom was painted several times during period. Location: Adjacent to coke quencher

Insul-Mastic Corp.



HOW YOU CAN . . .

Fight Corrosion

Cost of corrosion to industry is appallingly high. Much can be accomplished with latest scientific know-how in this field where only 1 per cent improvement means an annual savings of $60 million

By DR. ALLEN G. GRAY
Technical Editor

WHAT DOES corrosion mean to you in terms of dollars and cents? This year American industry will spend more than $6 billion for losses created by corrosion and rust.

Metalworking plants spend billions every year to prevent oxygen in the air from combining with metals to rust their products and destroy their facilities.

Economic and material loss from metal corrosion comes from money spent for protection and cost of replacement of corroded equipment. Don't forget that an incalculable, often higher, indirect loss may arise from shutdowns, overdesign and loss of product efficiency.

Be Realistic—Not all of this material loss can be prevented. Metals will always tend to revert to their ores or to compounds of lower energy levels despite corrosion protection. The amount that can be done may be limited economically by the continuous or periodic upkeep required of all protective measures. Notwithstanding, you will save money by taking full advantage of the latest scientific and engineering findings.

Fundamentals Foremost — When a metal corrodes, electric current flows similar to action inside a flashlight cell. At ordinary temperatures in air, corrosion can occur only if water is in actual contact with the metal surface. Otherwise, the necessary electric current accompanying corrosion cannot cycle through the metal.

Atmospheric corrosion, therefore, occurs only under conditions where it is possible for water to condense on the metal surface. If there is no water there can be no attack.

Impurities on the metal surface such as finger prints, or dust from the atmosphere can hasten condensation of moisture and cause rusting at low relative humidities.

Speeds Up Corrosion—Dissimilar metal combinations accelerate corrosive attack of the more active metal and at the same time reduce attack of the less active metal. This effect can be reduced by insulating the metals where they make contact, or by increasing the path over which the current must flow, such as by use of an insulating washer

4 ways to prevent corrosion

1. Right coating in right place
2. Corrosion resistant metals
3. Cathodic protection
4. Corrosion inhibitors

Wrapping gears and small parts in corrosion inhibitor treated paper. Volatile nature of inhibitor prevents rusting during storage and shipping

between a dissimilar metal bolt in a metal sheet.

Another Point—It is necessary to avoid contact of an active metal like aluminum or iron with water that has leeched out corrosion products from a metal like copper, since copper may be deposited on the aluminum or iron and form minute dissimilar metal couples possibly more damaging than larger size couples.

Just what can be done to reduce the corrosion losses which plague your business from all directions?

Inert Barriers—Since iron and steel constitute the bulk of metals in use, paints and metal coatings are the main lines of protection. Industry research is constantly improving their protective quality. Protective paints have improved by development of new vehicles and corrosion inhibitive primers.

Look Here—Use of corrosion resistant metals will expand because of economies effected by their use. One catalyst here is an increasing acceptance of bright metal surfaces such as polished chrome stainless steels for decorative applications.

If you dig into this matter deep enough you may find that you are not taking full advantage of the economic gain of replacing iron by corrosion resistant metals or alloys in some assemblies in your products.

Reverse the Process—Corrosion of buried metal is costing industry millions of dollars in labor and materials. Cathodic protection properly employed can normally control underground corrosion on almost any buried steel structure at a cost that is only a fraction of the value lost from corrosion.

Despite the fact that cathodic protection has proved itself to many companies, many other concerns continue to suffer needless waste because of a lack of understanding of the principles involved.

Chemicals Inhibit—Don't overlook the variety of benefits that you can gain by taking advantage of latest know-how in corrosion inhibitors. As a general rule these materials are substances which when added in small amounts will effectively decrease the corrosion rate.

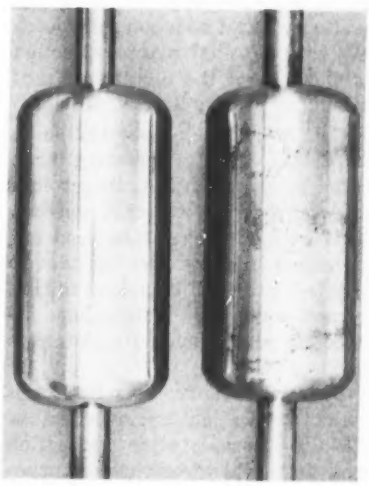
A new amine nitrite differs from conventional inhibitors in that it is slightly volatile at atmospheric temperature. This property gives this compound special industrial importance because it makes possible the prevention of atmospheric corrosion of steel articles in packages or containers without the necessity for coating the steel with the inhibitor.

Protect Your Plant and Facilities

Each year this country spends close to $2 billion for painting just to protect its metal structures and equipment against corrosion. This represents about a third of the total cost for all corrosion prevention materials and methods combined.

A sound painting program can slash your plant maintenance costs. What is the basis of such a program? Proper selection and proper application of protective coatings backed up with foolproof sys-

Angier paper containing volatile inhibitor used as drawer liner protects parts in storage from rusting



Fingerprints on metal surface can hasten condensation of moisture and cause rusting at low relative humidity

Humidity cabinet evaluates protective coatings at Battelle

DO YOU NEED A CORROSION ENGINEER?

How can you be certain you are taking full advantage of possibilities for cutting plant corrosion costs and improving durability of your products? First thing to check: Be sure someone is assigned top level responsibility for fighting corrosion. Chances are he will need technical help if he is not trained or experienced along corrosion-lines.

Just what can management expect from a corrosion engineer? Here are. . . .

TEN THINGS HE CAN DO FOR YOU

1. Select best coating and metal—corrosion-wise
2. Consult with designers on corrosion pitfalls
3. Diagnose failures and record experience
4. Set up specifications and standards
5. Improve competitive position through better quality
6. Undertake and improve inspection and tests
7. Establish preventive maintenance schedule
8. Preserve equipment and salvage corroded parts
9. Examine packaging methods for corrosion sabotage
10. Plan, execute and supervise corrosion test programs

tem of periodic inspection and repair.

How Thick? — Involved in the proper selection of paints are the choice of resin types and severity of exposure conditions. The matter of economic thickness of coating is a part of application considerations. Most common fault leading to ineffectual plant protection is violation of the requirements of minimum coating thickness.

Cost of surface preparation is an important item of painting cost, often being as much as 50 per cent of the cost of a 3-coat system. This expensive operation need not be repeated every time an area is painted, provided it is done initially and a sure-fire maintenance inspection and touch up schedule is used.

This schedule requires that each paint application be inspected at definite intervals after application and that local wire brushing, priming and cover coat renewal be done as soon as inspection shows the least sign of localized failure.

Be Sure of This—Lack of compatibility of newly applied paint with the paint already on the surface is one pitfall that can cause real trouble. When you find a good paint system stick to it. Study related factors to improve its durability. Consult the manufacturer and his technical staff in case of doubt of compatibility if a change is made.

Chemically inert resins open the door to an entirely new concept of surface protection with paints. While ordinary oil base paint provides protection to metal structures at a cost of a few cents per square foot its efficiency as a protective medium in industrial service falls off in the presence of heat, constant exposure to weather or to the chemical attack to which much of industry's equipment is frequently subjected.

Special for the Job—Modern protective coatings tailored to meet many of the drastic conditions encountered in plant maintenance fill a big gap in industry's arsenal of weapons for fighting corrosion.

Types are available to combat almost every form of corrosion. Vinyl coatings show unusual resistance to solvents, boiling water, steam and acids. Chlorinated rubber coatings are the basis for versatile maintenance paints resistant to acids and alkalies.

Alkyd base paints provide high quality exterior maintenance coatings with good appearance and weather characteristics. Furane resins form hard tough films of improved corrosion resistance over the phenolics. Epoxy resins, a relatively new development, are chalking up new durability records.

Heavy Coatings—Bitumen compositions for protective coatings may be divided into two general groups: Those predominantly of a coal tar base and those of asphaltic base. Coal tar compounds possess lower water permeabilities than those of asphaltic bases but the asphaltic type is more stable to weathering and direct sunlight.

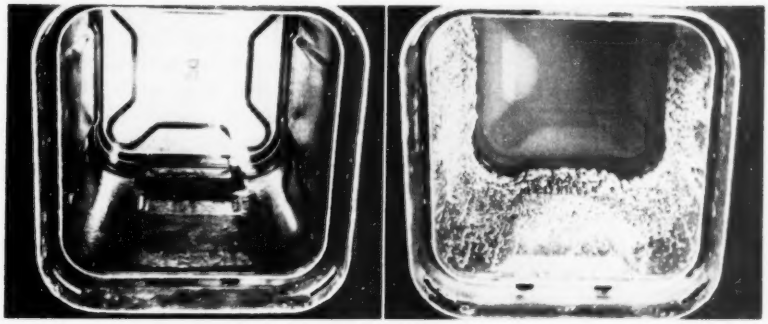
These materials are widely used as relatively low cost protection against acidic fumes and for general plant protection. Bitumen materials may be obtained in solvent solutions which will give thicknesses per coat approximating those of paint films. However, their greatest use is in the form of mastic compositions where thicknesses of coatings range from 15 mils to 1/16-inch.

Practical Pointers — The ideal plant maintenance coating system, based on optimum performance, should use thicknesses over the corrodable metal of around 5 mils. Coating applied too thin will fail early. Job inspection is aided by electric spark tester for examining continuity of applied barrier and thickness gages for measuring coating thickness.

The policy of buying coating materials on the basis of cost per gallon and coverage per square foot has lost industry millions of dollars in high labor costs and inadequate protection. The important criterion on which to base your procurement is minimum thickness per coat.

Don't overlook some of the less obvious methods for reducing your corrosion bill around the plant.

One of these is cathodic protection. It uses an impressed current



These hot dipped galvanized ammunition boxes contained a small amount of salt solution for 5 days. One at left had chromate type Iridite treatment

to prevent or to reduce the rate of corrosion of a metal by making the metal the cathode for the impressed current. Buried pipe or other metal structures can be thus protected externally for an almost indefinite period.

Drain Off Corrosion — Cathodic protection systems can be divided into three general classes depending on the source of the current drained from the metal. The term drainage is used by field engineers to mean the drawing of current from an underground structure by means of a metallic conductor for purpose of corrosion control.

Forced drainage uses a source of current such as a rectifier, generator or battery in conjunction with an auxiliary anode, such as carbon. Galvanic anode drainage uses an anode of an active metal such as zinc, aluminum or magnesium. Here the drainage current depends on the galvanic potential between the metal to be protected and the anode. Stray current or bus drainage is used for underground pipes and cables in areas where trolleys are operated and uses part of the trolley generator potential for draining the current.

Widest use of cathodic protection is on underground metallic pipes and cable sheaths. It may be used to protect the outside surface of almost any buried metallic structure. Gasoline and oil tanks and associated underground piping can be protected with forced drainage. Use of cathodic protection on the inside surfaces of water storage tanks, hot water tanks, condensers, water treatment tanks, and brine tanks may require special study.

Look Out for This—Hundreds of thousands of dollars have been wasted due to unnecessary failures from galvanic and stray current corrosion.

Stray current corrosion occurs on buried or submerged metallic structures and it differs from all other forms of corrosion damage in that the current causing the corrosion has a source external to the affected area. It is most common around electroplating installations, electrolytic refineries and in electric welding systems.

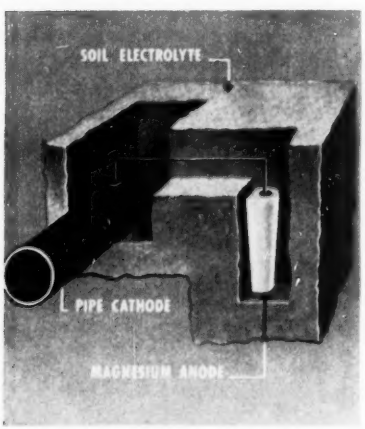
Failures which occur repeatedly in the same place are likely to be stray current failures. Voltage measurements will help you pin down the source of trouble. Protection, once the cause is established, is based on insulation or drainage similar to methods used for cathodic protection. Pumps installed in electroplating departments are often subject to rapid corrosion due to stray currents.

Protect the Products You Sell

If you manufacture metal products, chances are that the processes required to give necessary corrosion resistance and desired surface appearance are fully a third of your plant's total activities.

The coatings you depend on may be metallic — plated, dipped or sprayed. They may be inorganic layers resulting from chemical treatment; or they may be one of a variety of different types of organic coatings.

If your products are average it's a good bet that all three of these



Magnesium anodes used to protect buried metals ease the corrosion problems on pipe lines and tank farms

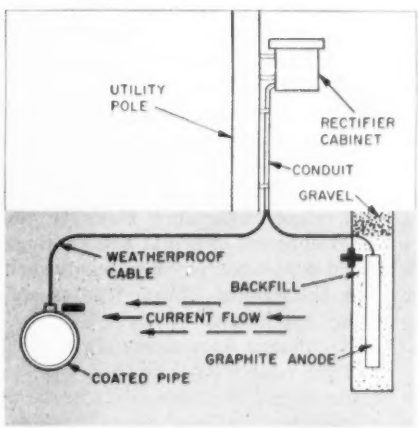
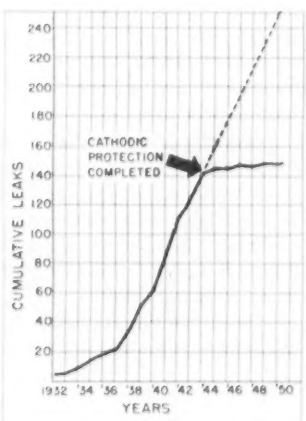
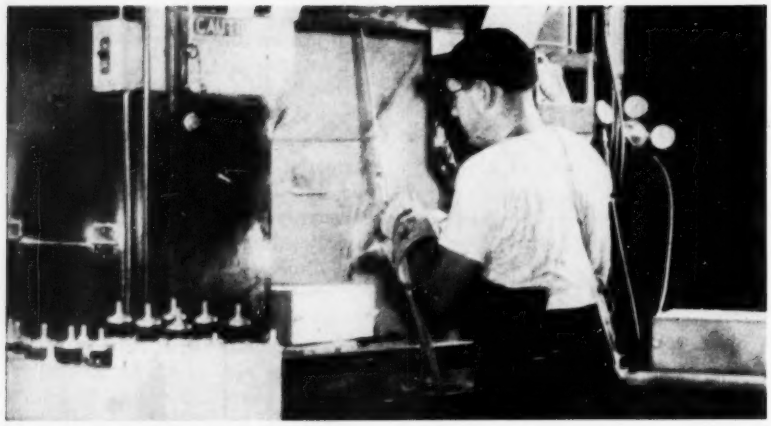


Diagram of cathodic protection system applied to underground pipe using a rectifier and a carbon anode



Corrosion leaks on steel mains in Houston, Texas before and after cathodic protection was installed



These Westinghouse power capacitors are sprayed with 0.010-inch of zinc to give positive corrosion protection. They are used in divergent climates

basic processes can do a job somewhere in your plant.

So this matter of selection of coatings is important. Effort put forth to get the right coating in the right spot will pay off in more ways than one.

Consider These—Most important factors to be considered in selection: 1. Purpose of the coating. 2. Use for which the finished article is intended. This involves not only the environment to which the finished article will be exposed but also its function, size, shape, cost, and expected length of useful life.

If the protective finish is intended to enhance the appearance and serviceability of an expensive article intended for lifetime service, or if it is applied to a piece of engineering equipment designed to operate for 20 years, the requirements, obviously, will be vastly different than if it is applied merely to provide sales appeal for an inexpensive article not intended to have a long life.

Several Factors—The protective value of metal coatings depend upon several interrelated factors: 1. Thickness and continuity of the coating. 2. Corrosion characteristics of both the coating and the basis metal, together with their electrochemical relationships in the environment to which they are exposed.

When classified in accordance with their corrosion protection characteristics metallic coatings fall into two major groups: 1. Those which are electronegative (anodic) to the basis metal. 2. Those which are electropositive (cathodic) to the basis metal. Zinc, cadmium and aluminum constitute the principal coatings of the first type. All other metals used for coating fall into the second category.

Electronegative coatings have the ability to protect the basis metal at discontinuities and pin holes which may exist in the coating. Electropositive coatings, on the other hand, are characterized by their tendency to promote corrosion of the basis metal at discontinuities which may exist in the coatings.

In both cases galvanic action is involved. This means that the presence of an electrolyte is necessary. In outdoor exposures, it results from surface condensation of atmospheric moisture, which is probably accentuated by the presence of hygroscopic materials in the minute surface irregularities of some coatings.

Zinc Coatings Looking Up—Zinc coatings are used primarily for corrosion protection of steel products. Formerly appearance was generally of minor importance. However, the development of bright zinc coatings and supplementary treatments such as the various chromate dips and the application of clear lacquers, to enhance appearance and durability, opened up new fields in consumer goods where an attractive appearance as well as utility is desirable.

In most environments, the corrosion of zinc coatings exhibits a linear relationship with time; that is, the protective value is directly proportional to thickness. Tests indicate that a given thickness of zinc whether applied by hot dipping, electroplating, Sheradizing, or spraying furnishes about the same protection to steel.

The only other commercial metal coating on steel that gives electrolytic protection about equal to zinc is cadmium. Aluminum coatings give electrolytic protection to steel under conditions where they remain active.

One objection to the use of zinc coatings is that at high temperatures and humidities corrosion is rapid and may result in the formation of bulky, white corrosion products. This gives an unsightly appearance and may also interfere with operation of intricate mechanisms. One of the best ways of retarding this type of corrosion is by application of inhibitive chromate films.

Dual Purpose—By far the largest use of nickel-chromium and copper-nickel-chromium coatings is for objects which must not only be protected from corrosion but must also present a bright and pleasing appearance. Cathodic coatings of this type do not afford galvanic protection of the basis metal laid bare at discontinuities. The protective value is governed primarily by the thickness of the plated coats. While it is true that the quality, cleanliness and smoothness of the basis metal influences the porosity developed in the coat, the effect of these variables becomes less important as the thickness of the deposit is increased.

Government restrictions on nickel necessitated changes in the conventional bright chrome coating finish. Several modifications are followed:

The first one is heavy copper, thin nickel followed by chromium. M-80 order was amended late last summer to permit an average strike of 0.00005-inch nickel for all parts in bright chrome finishing. NPA has just recently indicated its intentions to divert more nickel to electroplating in the second quarter of 1953.

Uses No Nickel—Second substitute uses no nickel. Chromium is plated directly over copper. A coating of clear baked enamel is

The palm tree that grows in Ohio

They planted it a year ago.
Leading steel publications covered the story:

"New All-American Lubricant For Cold Rolling Operations"

That's how The Ironsides Company of Columbus, Ohio, announced the first successful replacement for palm oil.

Instead of relying on palm trees—half a world away, tin plate producers now have a "palm tree" right in their own back yard.

Palmoshield looks, feels and acts like palm oil; requires absolutely no changes in mill operation. Already most of the major tin plate mills in this country and Canada are using Palmoshield for regular mill operations or for production test runs.

. . . and grows and grows and grows!

Production records set with Palmoshield: Recently a leading steel company, over a run of 20 consecutive shifts, increased production 15% over the average output with imported oil. No additional investment, no increase in manpower, and no changes in mill operation. Yet 115 tons of steel were rolled for every 110 before. One company broke the single-shift record, and still another broke both 8-hour and 24-hour records.

Backed by 60 years of specialization: Palmoshield is the result of Ironsides' sixty years of specialized research in the field of scientific lubrication. For your own lubricating problems, call or write The Ironsides Company, 270 West Mound Street, Columbus, Ohio.

SPECIAL LUBRICANTS and PRESERVATIVES

SHIELD PRODUCTS

IRONSIDES PALMOSHIELD

These auto fenders had six years of Detroit roof exposure. Paint was applied on bare metal at left and on Bonderite phosphate coating at right

advisable for outdoor exposure.

Copper chromium finishes according to a General Motors specification are required to withstand exposure in a humidity cabinet at 100 per cent relative humidity and 100° F for 96 hours without blistering or clouding. Those having a minimum clear enamel thickness of 0.001-inch must withstand 96 hours of salt spray testing without visible rusting or other corrosion of the metal underlying the clear enamel.

How Chemical Coatings Protect —The formation of a continuous nonmetallic (chemical) coating on metal surface retards corrosion since such coatings are non-conductors and stop the flow of electric currents between the anodic and cathodic areas. They also keep the moisture and oxygen of the atmosphere from contacting the basis metal.

Most widely used chemical coating is the phosphate type. Phosphate coatings on metals result from chemical reaction of phosphoric acid with the metal surface to form a nonmetallic coating, as contrasted with metallic coatings which do not require chemical combination with the basis metal.

These coatings increase the durable life of paint films applied to metal products. In addition to increasing the adhesion of the paint, the phosphate coating retards underfilm corrosion and the spread of corrosion wherever the paint film is scratched or abraded.

Organic Films — New organic coatings are available to give more effective and prolonged protection of metal products. Among the newer types of materials for protective coatings are the resins or film formers. These include the alkyds, ureas, melamines, acrylics, silicones, epon resins, vinyls, polystyrene, chlorinated rubbers and others.

Combination of colorability and protectiveness makes organic coatings suitable for many industrial and consumer applications. Alkyd resins are still probably the most useful of the film formers — the real backbone of organic coatings.

Alkyds are specified for the government for use in primers and enamels for tank trucks and other army equipment. U. S. Ordnance specification MIL-E-11237 specifies the use of an alkyd resin in a luster-less olive-drab finish. Federal specification TT-E-489 covers the use of alkyds in some thirty different colors for high gloss. New styrenated alkyds are now specified for fast drying ammunition coatings.

Silicone-alkyd finishes are No. 1 in uses where heat plus corrosion is involved. This finish holds on the metal at temperatures of 400 to 500° F. Combination of durable properties have reached an all time high in various modifications of silicone coatings.

Carbon Steel Specs Charted

Chart with which carbon steel specifications can be identified in seconds to save time sometimes lost hunting through individual specs is offered by Peter A. Frasse Co. Inc. It shows chemical analysis requirements for each of 60 military, army, navy, aeronautical and federal specifications. Also listed are specified forms (sheets, bars, etc.) and nearest corresponding SAE, AISI and AMS type numbers.

Printed on cardboard stock, the chart is regular filecard size and can be used for ready reference. Copies are available on request from the company, 17 Grand St., New York 13.

Machining Study Available

"Relation of Machining Time to Material Cost," an article by E. A. Hoffman, engineering sales manager, La Salle Steel Co., has been prepared for distribution by the company. The author presents an analysis of the cost-time-weight relationship for open-hearth steels, bessemer steels, and the free-machining, lead-bearing steels. Particular problem posed is whether, in selecting a new steel, the savings in machining time will offset the extra cost of the steel.

The article includes a comparative machinability chart on representative grades, a profit selector chart for steel bars and a formula to determine equivalent cost per part. Reprints can be obtained without charge by writing the company, Chicago 80.

Firm Enters Cooler Field

Entry into the central cooling unit field is announced by Iron Fireman Mfg. Co., Cleveland. According to R. C. Wright, manager, research and development engineering, the company's unit has been especially designed for easy access to all its elements. Any part can be serviced on the job without the need for removing the entire unit.

One feature is inclusion of a thermally activated multiple feed expansion valve. The condenser is easily cleaned, and can be connected either to a city water system or to a cooling tower. Spring-mounted compressor is isolated from refrigerant lines by vibration eliminators to reduce operating noise. Complete protection is furnished by a thermal overload device and by a high-low pressure control.

The unit is available in 2 and 3-ton sizes, 22 x 37 x 47 inches. It can be installed in any forced warm air heating system.

Standard Proceedings Published

Proceedings of the third National Standardization Conference, held in conjunction with the Centennial of Engineering in Chicago last September have been published by American Standards Association. Combined with the proceedings in the printed booklet are the principal addresses presented at the association's annual meeting award luncheon held Nov. 25 in New York.

Papers feature standardization experience and practices in industrial construction, chemicals, safety, purchasing, photography, welding and in the international field.

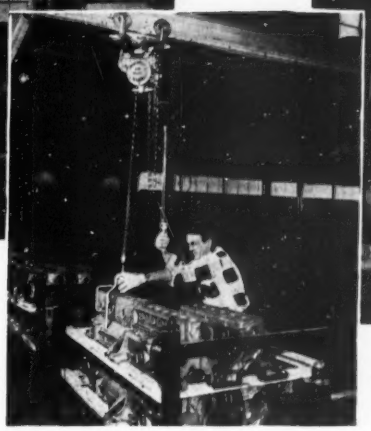
The booklet is available from the association, 70 E. 45 St., New York 17, for $2.

181 Air Hoists

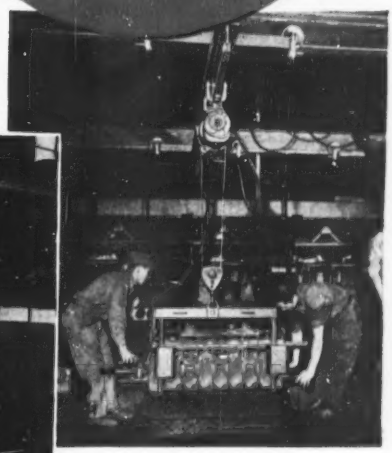
...selected by Cleveland FORD Foundry

Production lines equipped with Ingersoll-Rand Air Hoists

Closing the molds on the 6-cylinder block line with Size BN Hoists and Pendent Throttle.



End of the line . . . Size LC-2 Hoist with Pendent Throttle speeds the loading of 12 finished blocks on special skids.



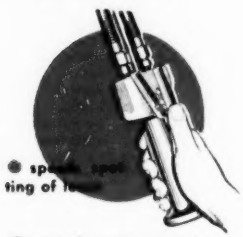
The Pendent Throttle for controlling the Size BN Hoist is mounted on this special core setting fixture.

Why production men choose I-R Air Hoists

There are 58 sizes available. Lifting capacities range from 200 lbs. to 20,000 lbs.

PENDENT THROTTLE

The only complete line of air hoists with convenient "one-hand" control



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● provides "Finger-tip" control over full range of speeds

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- **VARIABLE SPEED**—Lifting power ranges from a smooth creep to full speed.
- **OVERLOAD FACTOR**—Air motors cannot be damaged by overloading. More horsepower per pound of weight.
- **SMOOTH CONTROL**—A single rotary valve eliminates jerks and provides the exceptionally smooth power.
- **AUTOMATIC BRAKE**—A positive brake holds the load even though the air supply should fail.
- **POPPET TYPE THROTTLE VALVE**—Prevents air leakage when the hoist is idle.
- **SPOOL DRUMS**—Furnished in place of grooved drums where extra lift is desired.
- **LOW MAINTENANCE**—I-R hoists are universally recognized for their reliability and low maintenance.

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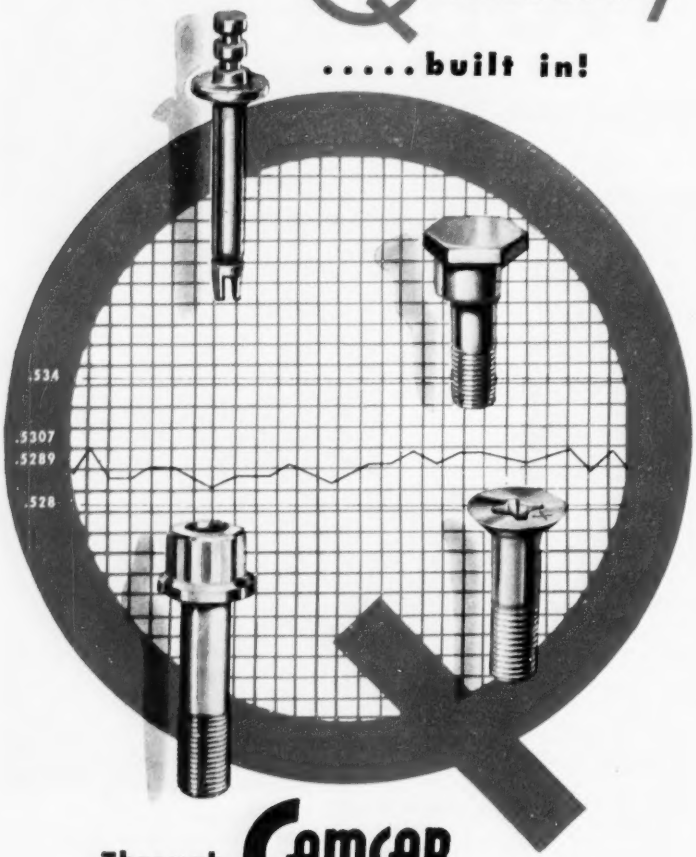

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CALENDAR
OF MEETINGS

April 8-10, Society of the Plastics Industry Inc.: Pacific Coast conference, Last Frontier hotel, Las Vegas, Nevada. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

April 9-10, Malleable Founders' Society: Market development conference, Illinois Institute of Technology, Chicago. Society address: Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

April 9-11, Lead Industries Association: Annual meeting for members, The Greenbrier, White Sulphur Springs, W. Va. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 12-15, American Supply & Machinery Manufacturers Association: Annual meeting and conference booth program, Hotel Columbus, Miami, Fla. Association address: 814 Clark Bldg., Pittsburgh 22. Secretary: R. Kennedy Hanson.

April 12-16, Electrochemical Society Inc.: Annual spring meeting, Hotel Statler, New York. Society address: 235 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

April 13-15, International Acetylene Association: Annual spring meeting, Hotel Biltmore, Atlanta. Association address: 30 E. 42nd St., New York 17. Secretary: H. F. Reinhard.

April 13-15, American Society of Lubrication Engineers: Annual meeting and exhibit, Hotel Statler, Boston. Society address: 343 S. Dearborn St., Chicago 4. Secretary: William P. Youngclaus Jr.

April 14-15, Westinghouse Machine Tool Electrification Forum: Annual session, Hotel Statler, Buffalo. Information: E. F. Grapes, technical publicity, Box 2278, Pittsburgh 30.

April 14-16, Conveyor Equipment Manufacturers Association and University of Illinois Department of Engineering: Conveyor institute, University of Illinois, Champaign, Ill.

April 16-17, American Machine Tool Distributors Association: Spring meeting, Netherland Plaza hotel, Cincinnati. Association address: 1900 Arch St., Philadelphia 3. Secretary: Thomas A. Fernely Jr.

April 16-17, The Wire Association: Regional meeting, Stacy-Trent hotel, Trenton, N. J. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

April 16-19, Grinding Wheel Institute: Spring meeting, The Homestead, Hot Springs, Va. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: Hunter-Thomas Associates, re F. A. Peterson.

April 18-19, Packaging Machinery Manufacturers Institute: Spring meeting, Hotel Sheraton, Chicago. Institute address: 342 Madison Ave., New York 17. Secretary: Helen L. Stratton.

April 19-23, American Hardware Manufacturers Association: Spring meeting, Hotel Adolphus, Dallas. Association address: 342 Madison Ave., New York 17. Secretary: Arthur L. Faubel.

April 20-22, Metal Powder Association: Annual meeting and exhibit, Hotel Cleveland, Cleveland. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 20-22, AIME Blast Furnace, Coke Oven & Raw Materials Committee and National Open Hearth Steel Committee: Annual conference, Hotel Statler, Buffalo. Institute address: 29 W. 39th St., New York 18.

April 20-23, American Management Association: National Packaging Exposition: Navy Pier, Chicago. Association address: 330 W. 42nd St., New York 36. Information: Donald G. Keen.

April 20-23, National Screw Machine Products Association: Spring meeting, Hotel St. Moritz, New York. Association address: 2860 E. 130th St., Cleveland 20. Secretary: Orrin B. Berntz.

April 22-23, American Institute of Steel Construction Inc.: Spring engineering conference, Detroit Engineering Society Bldg., Detroit. Institute address: 101 Park Ave., New York Executive vice president: L. Abbett Post.

No. 1-B electric vibrating Feeder—for small-capacity operations up to 3500 pounds per hour. Ideal for laboratory use.

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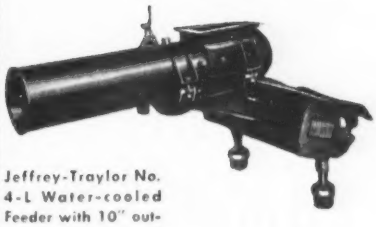
A type and size to meet requirements in continuous processing—at low over-all cost.

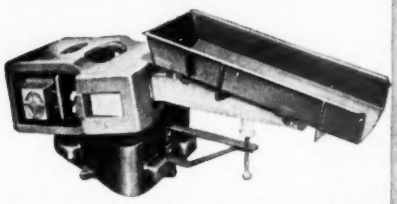
Absolute control over flow of wide variety of materials.

ULTIMATE IN FLEXIBILITY!

Literature Available

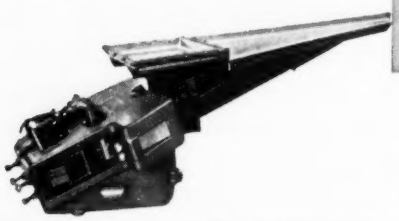


Jeffrey-Traylor No. 4-L Water-cooled Feeder with 10" outside diameter x 4' long water-jacketed deck. For feeding to high temperature furnaces or for handling extremely hot materials.



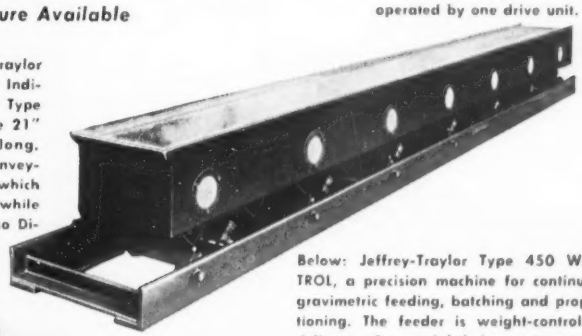
Jeffrey-Traylor No. 3 electric vibrating spark-proof Feeder with 12" x 30" open-pan deck. For feeding operations in hazardous atmospheres or under extreme moisture conditions.

M-V Mechanical Vibrating Conveyor for conveying abrasive, lumpy or rough materials, hot or cold, dry or wet, as well as fine materials. Up to 80' can be operated by one drive unit.

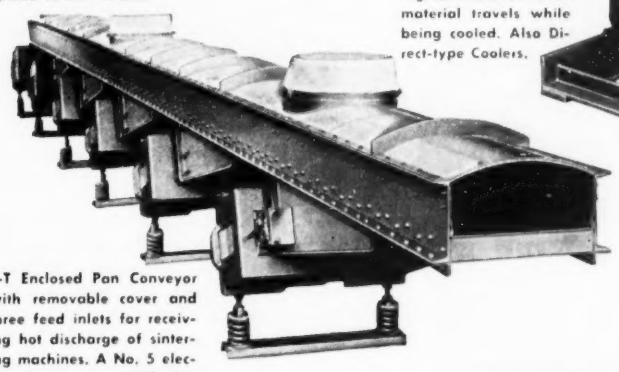


Jeffrey-Traylor electric vibrating Spreader Feeder, 14" wide x 70" long with one edge tapered to spread to 55" width.

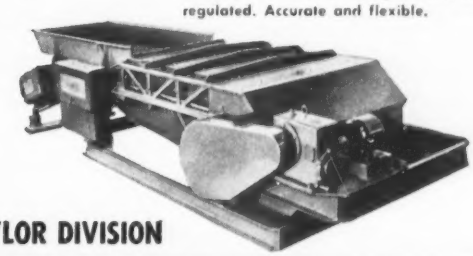
Right: Jeffrey-Traylor electric vibrating Indirect-type Cooler. Type HI-21F open type 21" wide and 18' long. Has solid plate conveying surface over which material travels while being cooled. Also Direct-type Coolers.



Below: Jeffrey-Traylor Type 450 WAY-TROL, a precision machine for continuous gravimetric feeding, batching and proportioning. The feeder is weight-controlled, delivery of material being automatcally regulated. Accurate and flexible.



J-T Enclosed Pan Conveyor with removable cover and three feed inlets for receiving hot discharge of sintering machines. A No. 5 electric vibrating type, 25" wide x 45' long.



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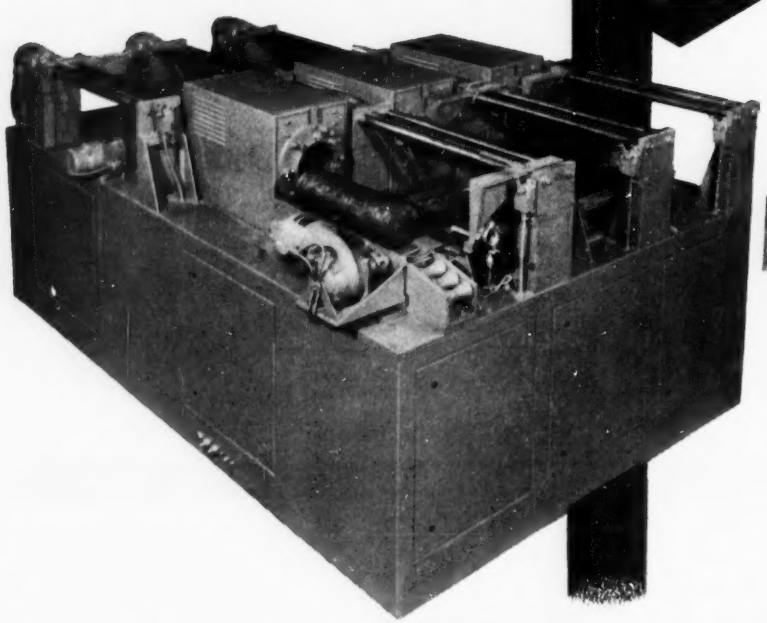
THIS Loftus Universal Thermo-Induction furnace is the most flexible 60-cycle billet heater ever designed. You can heat every non-ferrous metal, in the same furnace, either consecutively or simultaneously, to its respective forging or extrusion temperature. The unit maintains high efficiency, constantly, even when heating **short-length** billets.

Loftus Thermo-Induction gives you the most practical, dependable, and efficient method of heating non-ferrous metals. You achieve uniform heating in a matter of seconds. Production is continuous, and completely automatic. The press operator controls the furnace. Separate, positive control of each coil is at his fingertips.



The Loftus 60-cycle Thermo-Induction Heater illustrated is designed to heat copper, brass, aluminum, and cupro-nickel for extrusion purposes. The unit is readily adaptable for forging and rolling processes. It is possible, with this billet heater to heat a 5" dia. Aluminum billet to 800° F., an 8" dia. brass billet to 1550° F., and a 10" dia. cupro-nickel billet to 1950° ALL AT THE SAME TIME. IN THE ONE FURNACE. Each billet is heated independently . . . from a single control panel.

Send Today for Booklet describing Loftus 60 Cycle Induction Heating in Detail

Loftus **ENGINEERING CORPORATION**

Designers and Builders of Industrial Furnaces

610 Smithfield Street • Pittsburgh 22, Pennsylvania

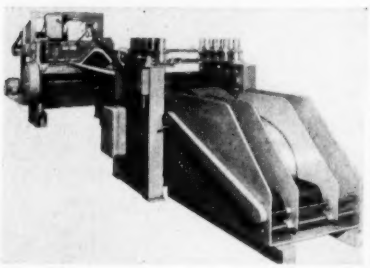
NEW PRODUCTS and equipment

Reply cards on page 117 will bring you more information on any new products and equipment in this issue

One-Man Shear Line

. . . works coils to 13-gage

One operator can attend this machine as it decoils, levels, shears and stacks automatically. The machine will handle any flat material, such as steel or aluminum. It works steel coils up to 13-gage; handles widths from 6 to 60 inches.



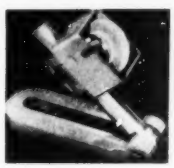
Machine can be set to shear length from 6 to 60 inches, with plus or minus variation of only 1/64-inch. One adjustment is required to change lengths.

Operating speeds reach 150 linear feet per minute, depending on length of cut. Union Tool Corp., Dept. ST, Warsaw, Ind.

FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Grinding Wheel Dresser

. . .gains application flexibility



Universal model grinding wheel dresser can be bolted down for cutter or cylindrical grinders or can be used on the magnetic chuck for surface grinding. Indicating further flexibility, its shaft can be tipped all the way forward or backward and the dresser wheel unit adjusted up or down or made to swivel on the shaft depending on angle desired for dressing or trueing the grinding wheel.

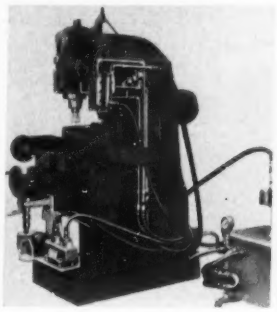
The model 6, with manufacturer's N-D1-46 or N-D2-46 wheels provides an excellent diamond wheel dresser. L. Newman, Dept. ST, 1001 24th St., Oakland 7, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Hydraulic Copying Attachment

. . . fits all standard millers

Attachment for milling machine permits machining of complicated shapes such as turbine blades, molded parts, plastic shapes, etc. The attachment is capable of both large and small runs, establishes



uniform machine parts quality and works to close tolerances. It can be installed on all standard milling machines and operated by unskilled labor. Morey Machinery Co. Inc., Dept. ST, 410 Broome St., New York 13, N. Y.

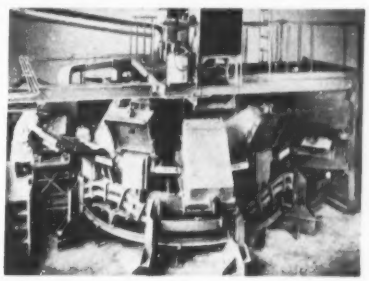
FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Automatic Shell Molder

. . . produces 500 molds per hour

This 12-station machine is capable of producing 500 shell molds per hour. It is automatic, from sand and resin blending to the finished mold. A single workman attends the machine, which rotates counterclockwise through mold forming, curing, to finished mold delivery.

Machine's pattern size is 28 x 22 inches. Pattern plates can be changed quickly, without stopping



the machine, to gain flexibility of production. It can be operated with all patterns producing the same molds or with twelve different patterns. Mechanical Handling Systems Inc., Dept. ST, 4601 Nancy Ave., Detroit 12, Mich.

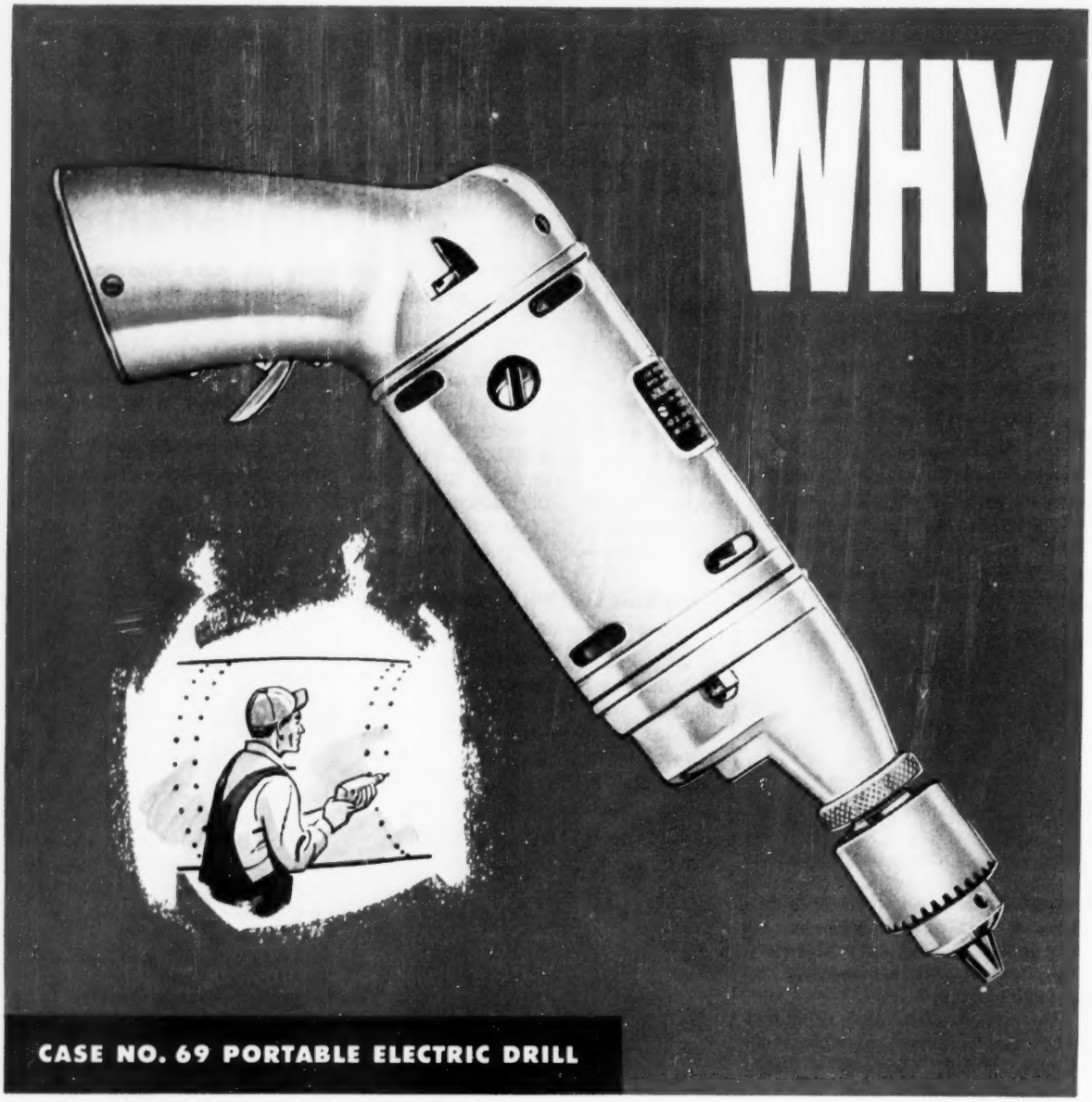
FOR MORE DATA—CIRCLE REPLY CARD NO. 4

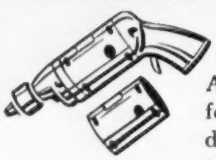
Improved Auto-Collimator

. . . tests to 0.0000025-inch

Auto-collimator is an instrument of the type described in Military Standard 120 for measuring surface plate flatness. The instrument can be described as the equivalent of an independent super-precision level, free from effects of temperature change, normal shop vibration, or wear. It gives readings to 0.0000025-inch per inch in any plane—horizontal, vertical or inclined. Use of an optical right-angle accessory permits checks in a direction perpendicular to its own axis.

An improved filter produces sharper and clearer readings. Sup-





A switch to aluminum tubing for the housing of this electric drill permitted the manufacturer to capitalize on two important features of aluminum . . . its light weight and its naturally attractive finish.

The savings in weight is a direct selling point since lightness is of utmost importance in a hand tool of this kind. Furthermore, the manufacturer effected important savings in shipping costs.

Production and assembly costs were also cut since aluminum is easily fabricated and requires only simple buffing for finishing.

The manufacturer, Portable Electric Tools, Inc., of Chicago, Illinois, discovered also that aluminum is permanently non-rusting, will neither rust nor corrode should it become nicked or worn.

Perhaps this application of aluminum may suggest to you a similar conversion from other materials. Dollar savings in manufacturing and shipping costs, high corrosion resistance, naturally attractive finish plus added sales appeal are yours with aluminum.

LET ALUMINUM SERVE YOU, TOO

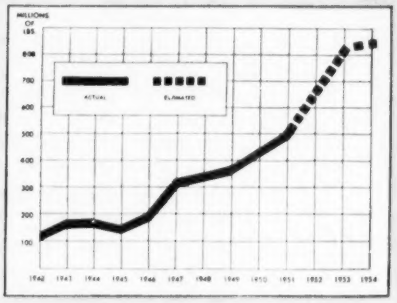
ALUMINUM ?

...because it has an ideal combination of advantages found in no other metal!

More aluminum is being specified in designs today because aluminum improves products and increases sales. Let Reynolds Aluminum Specialists help your designers and engineers get maximum benefits from this modern metal. Remember, only aluminum gives you . . .

- ★ **Lightweight with great strength**
- ★ **Consistently low cost**
  no more now than before World War II
- ★ **Natural resistance to rust and corrosion**
- ★ **Attractive appearance**
- ★ **Ease of fabrication by modern methods**

STILL MORE ALUMINUM COMING



The expanding primary aluminum production of Reynolds Metals Company . . . a historic chapter in the company's 33 years of continuing growth. And primary supplies of aluminum ore will be ample for generations.

To the man in charge of production

Acquaint yourself with accepted techniques for fabricating aluminum. Write on your letterhead for aluminum fabrication books listed at right. On special problems consult with Reynolds staff of aluminum specialists. Reynolds Metals Company, 2520 South Third Street, Louisville 1, Kentucky.

Yours For The Asking . . .
REYNOLDS TECHNICAL BOOKS

(please request on business letterhead)

- Aluminum Data Book
  (Aluminum Alloys and Mill Products)
- Aluminum Structural Design
- Aluminum Powders and Pastes
- Designing with Aluminum Extrusions
- Fastening Methods for Aluminum
- Finishes for Aluminum
- Forming Aluminum
- Heat Treating Aluminum Alloys
- Machining Aluminum Alloys
- Welding Aluminum
- Metals Weight Slide Rule

Complete index of all technical literature and films on aluminum design and fabrication also available.

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cold forged

metal fasteners

For (√) high quality material, (√) precise machining, (√) fast assembly, and (√) good appearance, specify CHANDLER cold forged metal fasteners. They are manufactured from tested high quality alloy steel by the most modern machinery and methods. Every fastener must pass rigid inspection to make sure it meets your specifications. This uniform high quality makes assembly faster, and smoothly finished heads assure good appearance of the completed assemblies.

Specialists in Alloy Bolts . . . Grinding to close tolerances . . . Drilled heads or shanks. Diameters 1/4" 5/16" 3/8" to 3" in length and diameters 7/16" 1/2" 9/16" to 5" in length.

958-CH

Manufacturers of Place Self Locking Bolts

Chandler Products Corp.

1488 Chardon Road • Cleveland 17, Ohio

NEW PRODUCTS and equipment

ports for leveling screws insure steady positioning in adjustment. Engis Equipment Co., Dept. ST., 431 S. Dearborn St., Chicago 5, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Toolroom Height Gage

. . . measures critical dimensions

Precise measurement of critical dimensions encountered in toolroom work is the function of this Airetest indicator. Simple air height gage has adequate amplification, gives positive repeat readings when approached from front, back or either side. Uses in addition to height gage work can be

found in static strain gages, in dynamic strain gages with a recording unit, and as a center pickup unit in machine tools.

It is also a master testing device to determine flatness, parallelism, concentricity and other geometrical features of parts resting on a surface plate. Design permits use in holes, slots and grooves impossible with some indicators because of interference caused by the dial face. Sheffield Corp., Dept. ST, Dayton 1, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Self-Cleaning Collet

. . . for automatics, lathes

A self-cleaning collet is designed for use on automatics, turret lathes and other machines where the collet is used in a rotating spindle.

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

Yours FOR THE ASKING

TEAR OUT CARD, FILL IN and MAIL TODAY!

67. Oil, Gas or Stoker Boilers

Kewanee-Ross Corp.—Square heat type R boilers for oil, gas or stoker firing are described and illustrated in 4-page catalog No. 88. Twelve sizes with outputs of 216,000 to 1,200,000 Btu per hour are covered. Complete specs are given on the entire line.

68. Structural Shapes

Kling Bros. Engineering Works—"Engineered Structural Shapes" is 4-page illustrated bulletin which covers such shapes as rolled or formed angles, beams, channels, bars or rails of steel, aluminum or brass. Any size or shape can be engineered and produced to suit customer's requirements.

69. Electrical Insulation

Dow Corning Corp.—"Specify Class H Insulation" is title of 8-page illustrated bulletin which discusses advantages, properties and applications of electrical insulating materials made with silicones. Various types of insulations and their features are tabulated.

70. Trolley Busway Systems

Feedrail Corp.—Described and illustrated in 4-page bulletin No. 27 are heavy duty trolley busway electric power distribution systems of 250, 375 and 500 amp; 250 v dc, 575 v ac, single and three-phase.

71. Paint Spray Booth

DuBois Co.—Two illustrated bulletins "Problems of Spray Booth Operation" and "Developments in Spray Booth Operation" deal with common problems and their solution. Also available is 4-page bulletin "Recommendations for Compounding, Marking and Purging of Wet Paint Spray Booths."

72. Special Natural Rubber

Linatex Corp. of America—Linatex is a special form of natural rubber, manufactured in Malaya by a process that preserves the crystal structure and imparts additional qualities such as abrasion, corrosion, vibration and chemical resistance. Described and illustrated in 4-page bulletin L-101, it is produced in sheet form in thicknesses of 1/32 to ½ in. Applications are shown.

73. Control Valve Design

Conoflow Corp.—"New Techniques in Control Valve Design" is title of 16-page technical manual which covers in concise language present day pneumatic final control elements and possible design of tomorrow. Many illustrations and diagrams appear.

74. Thread Roller

D. H. Prutton Machinery Co.—Performance data and specifications on the "first machine to roll threads in hollow work on a high production basis" are contained in "Flash" bulletin. Machine has produced as high as 19,440 hollow ½-in.-13 set screws per hour, with production proportionately higher on smaller parts.

75. Hard Facing Alloys

Wall Colmonoy Corp.—Various hard facing alloys produced by this company are covered in catalog No. 77 of 12 pages. Characteristics of iron and nickel base alloys, applications, application methods, etc., are included.

76. Woven Wire Conveyor Belts

Cambridge Wire Cloth Co.—In the 130 pages of illustrated wire-bound catalog you'll find much information on various applications of woven wire conveyor belts. Various weaves are illustrated and specifications are tabulated. Also covered are belt drive construction and roller and detachable belts, among other data.

77. Air & Gas Compressors

Pennsylvania Pump & Compressor Co.—Advanced design class ATCL Oilfreair and Oilfregas compressors are subject of 4-page illustrated bulletin 600. A cross-sectional drawing shows design features and text describes the units which compress gases free of oil and oily vapor.

STEEL
Penton Building, Cleveland 13, Ohio

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78. Wire Rope Sling Guidance

A. Leschen & Sons Rope Co.—Practical information on selection and use of wire rope slings can be found in 64-page "Sling and Fittings Handbook" FS-52. Charts show size of sling required in a given application, correct sling angles and fitting application procedures.

79. Electronic Recorders

Swartwout Co.—Photos, schematic diagrams showing principles of operation and dimensional sketches are featured in 6-page bulletin A-704 on Autronic Recorders. This miniature all-electronic instrument for use in chemical processing plants, refineries, central stations and industrial plants gives a true linear trace.

80. Industrial Trucks

Lewis-Shepard Products Inc.—In 8 illustrated pages, catalog 34 describes the Jacklift Electric and Master Jackstacker industrial trucks. Engineering and operating features are covered along with drawings, specs and maintenance features.

81. Magnet Disconnect Switch

Electric Controller & Mfg. Co.—Application, operation and features of EC&M disconnect switch for lifting magnets are presented in data sheet 906. Switch not only has high interrupting capacity, but establishes a discharge path if it is opened with magnet energized.

82. Cork Products

Dodge Cork Co.—Revised 4-page bulletin 1h/Do on Dodge industrial cork products includes information on cork structure, natural cork products, cork compositions and physical characteristics. Data is tabulated on density, tensile strength, compression and coefficient of friction.

83. Expansion Joints

Flexonics Corp.—Specs and supporting data on improved Flexon expansion joints, with increased traverse per corrugation, are presented in 16-page illustrated catalog CMH-128. Also covered is information on corrugated and convoluted types of flexible metal hose, couplings, flanges, nipples, etc.

84. Fastener Specialties

Camcar Screw & Mfg. Corp.—Facilities of this company for engineering and producing specially designed cold-headed parts and fasteners are outlined in 8-page illustrated bulletin. Service is in addition to the manufacture of sems, thread cutters, hex head sheet metal screws and Phillips head screws in all cold-heading materials.

85. Industrial Hose Assemblies

J. N. Fauver Co.—Descriptions and specifications for line of industrial hose assemblies, couplings, stems, swivels and accessories are found in 24-page catalog No. 52. Wide variety of hoses is described and mounting instructions are given.

86. Presses, Clutches & Brakes

Federal Machine & Welder Co.—12-page illustrated bulletin on the Warco straight-side double-crank press line and 6-page data folder on the Warco pneumatic clutch and brake point out design and performance features of these machines.

87. Worm Gear Reducers

Cleveland Worm & Gear Co.—If you specify, purchase or recommend machine drives or speed reducers, you should have 180-page catalog 400. It illustrates and describes complete line of worm gear speed reducers with full data on dimensions, weights and horsepower capacities.

EDITORIAL REPRINTS:

88. Titanium Cutting

Research project for Kennecott Copper reveals definite conclusions on titanium machining. The study points up need for improvement in cutting tools and fluids. V. J. Gauthier, engineering professor at New York University, discusses these and other variables relative to titanium in STEEL reprint "Guideposts to Titanium Cutting."

89. Induction Heating

"Induction Heating Cuts Costs on Many Fronts" is STEEL reprint which discusses advantages of modern induction heating techniques to improve quality, increase production and lower costs in many types of operations.

90. The Blast Furnace

Part II of C. E. Agnew's STEEL article "Don't Write Off the Blast Furnace" is now available in reprint form. Author discusses recommended alterations in the design of present-day blast furnaces for purpose of employing oxygen enriched blast and how these alterations warrant the study of operating principles, theories and specification.

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NEW PRODUCTS and equipment

Self-cleaning feature consists of an inclined plane on the following edge of each slot face. The angular surfaces act as fan blades which forcibly repel foreign matter. Sheffer Collet Co., Dept. ST, Traverse City, Mich.

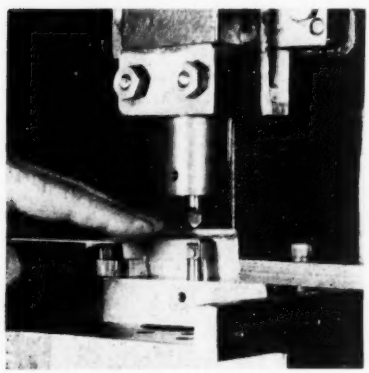
FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Punch and Die Fastener

. . . buttons metal to metal

Two pieces of metal are fastened together without any additional element—no bolts, rivets or welds —by the Metalacing method. Employing a punch and yieldable die; the system literally buttons metal to metal. An ordinary punch press can be converted to the job simply by inserting the punch and die.

Three separate operations take place during impact of punch.



Punch creates a double incision in the two sheets being fastened. Metal between the incisions is pushed down against the anvil of the die beneath the sheets and between the die's movable jaws. There, force of impact spreads depressed metal sideways, making it a permanent fastening wedge. The fastener works with any metal that can be sheared, drawn or upset and has functioned successfully on a maximum ¼-inch thick steel. Crockatt

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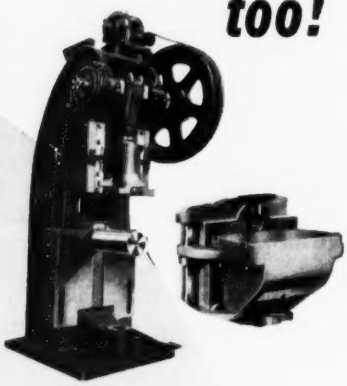
Abrasive Belts

for grinding, sanding, polishing — metal, wood, leather, plastics, rubber.

ABRASIVE PRODUCTS, INC.
511 Pearl Street
South Braintree 85, Massachusetts

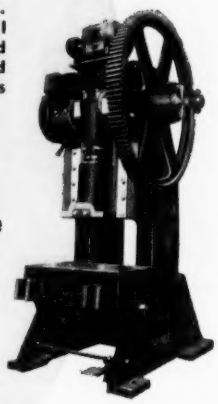
The trend is to Thomas for PRESSES too!

Illustration shows one of many Thomas presses in plant of McKinney Mfg Co., world-famous producers of builders' hardware.



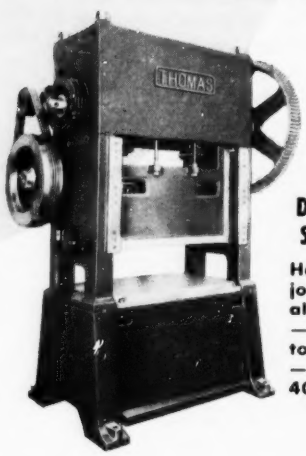
Thomas Horn Type

56 to 106 ton capacities. Horns, special bolsters and swinging bed attachments available.



Open Back Inclinable

Sturdily built for the toughest jobs, in 56, 80 and 106 ton capacities.



Double Crank Straight Side

Handles larger jobs economically. Capacities—75 to 300 tons. Bed sizes—30 x 48" to 40 x 120".

THOMAS PRESSES are designed and built by the same organization that has, for years, produced the world's leading line of spacing machines, heavy duty shears and other metal-working machinery.

In Thomas Presses you secure the advantage of rugged construction, and the utmost in mechanical efficiency and operating economy. All Thomas Presses are built to operate *continuously* at rated capacity!

• Let us help you select the press best fitted to your individual needs. Write.

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37

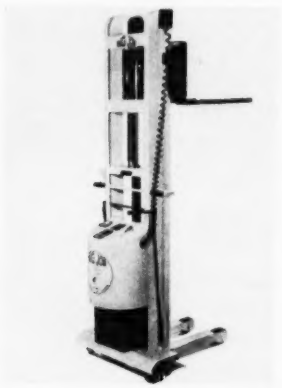
Engineering Co., Dept. ST, San Francisco, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Hydraulic Lift Line

. . . manual or battery-operated

Line of 1000-pound capacity trucks that operate manually or from battery power is designed to increase ease and safety in handling bulky loads. Straddle type base can be furnished in a range of widths to 50 inches. Forks are adjustable in any position, to



widths that provide the best load support. Swivel casters at rear and roller bearing wheels in front afford maximum maneuverability in minimum space.

Dual ground gripping brakes, fitted with brake shoes, are operated by a single hand lever. An optional remote control on battery models permits the operator to travel with the load and converts the lift to a portable elevator. Big Joe Mfg. Co., Dept. ST, 900 W. Jackson Blvd., Chicago 7, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Welding Electrode

. . . flexibility of application

Designated as GE type W-610-A, this general purpose, mild steel welding electrode is a direct current reverse polarity rod meeting AWS class E-6010 specifications. It facilitates butt, fillet, lap joint and edge welding in all positions. Its ability to take high currents, together with freedom from reaction pitting, fingernailing, spatter and blistering of coating assures a high ratio of inches-of-welding to inches-of-electrode used.

OUT OUR WAY

MAKIN' SKATES ON COMPANY TIME, HAH! OKAY, LET IT END THERE! DON'T LET ME KETCH YOU TRYIN' TO MAKE A RINK TO GO WITH 'EM!
I CALL MAKIN' SKATES COMPANY BUSINESS! YOU NEED 'EM AROUND HERE WITH THESE OILY, GREASY FLOORS!
YEAH--SOMEONE OUGHT TO TELL TH' BOSS ABOUT SOL-SPEEDI-DRI!
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Tops the field— in sales and value!

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"Dry cleaning" with Sol-Speedi-Dri is industry's favorite way to keep floors clean and slip-proof. Sol-Speedi-Dri is the largest selling oil and grease absorbent in the country. That's because pound for pound, dollar for dollar, it gives you *more for your money*, all factors considered. You can count on consistent quality, too—careful laboratory controls see to that. Send coupon today for free sample and literature.

SPEEDI-DRI CORP. 210 W. Washington Sq., Philadelphia 5, Pa.

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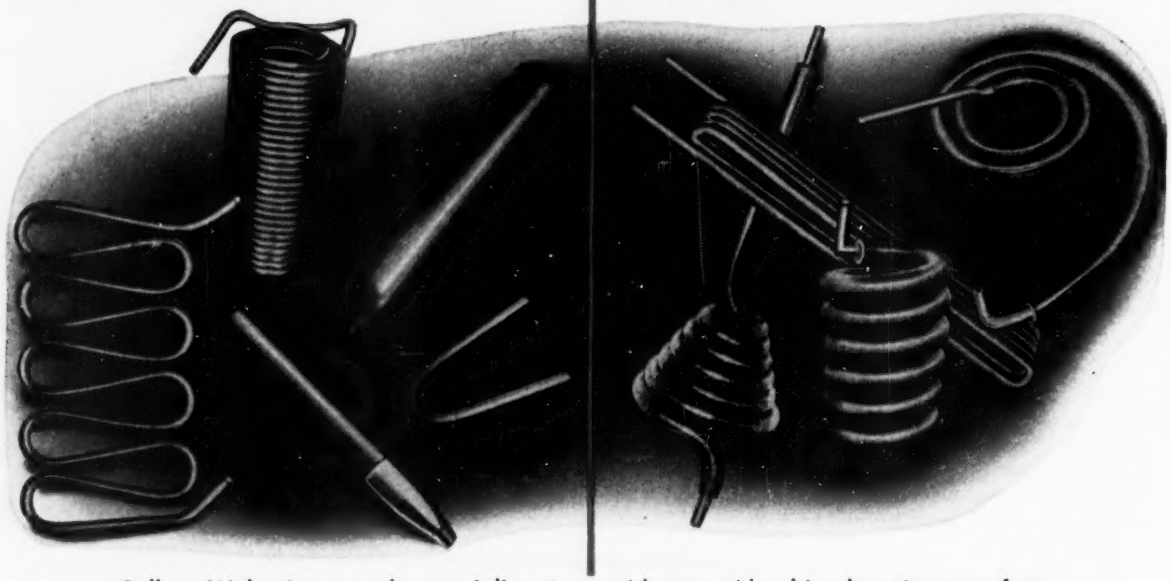
Like this . . .
IN FINNED TUBE



Call on Wolverine, as tube specialists, to provide you with tubing bent into any form that will best meet your particular requirements. Illustrated above are only a few typical forms.

Whether you require a simple bend, a closely wound coil or a more complex one — whether in plain tube or in the unique Wolverine Trufin* (the integral finned tube), it can be provided by Wolverine to your complete satisfaction.

Think of Wolverine first when you think of tube in any form — straight lengths or fabricated. Our Customer Engineering Service will be glad to help you in selecting the proper tube and tubular form. Send for our booklet, Fabricated Tubular Parts.

*REG. U. S. PAT. OFF.

Wolverine Trufin and the Wolverine Spun End Process available in Canada through the Unifin Tube Co., London, Ontario.

WOLVERINE TUBE DIVISION
of CALUMET & HECLA, INC.
Manufacturers of Tubing Exclusively
1439 CENTRAL AVENUE • DETROIT 9, MICHIGAN
Plants in Detroit, Mich. & Decatur, Ala. *Sales offices in Principal Cities*

ESTABLISHED 1916

Export Department, 13 E. 40th St., New York 16, N. Y.

Other Wolverine Products

CAPILATOR*
—the capillary tube for restriction purposes
COMMERCIAL TUBE
AUTOMOTIVE TUBE
CONDENSER TUBE
COPPER WATER TUBE (K-L-M)
ELECTRIC WELDED STEEL TUBE
FABRICATED TUBULAR PARTS
WOLVERINE TRUFIN*
—the integral finned tube
REFRIGERATION AND AIR CONDITIONING TUBE
(Plain or Tin Plated)
S.P.S. PIPE
SPUN-END TUBE†

*Reg. U.S. Pat. Off.
†A Patented Process RE 22465

SPECIFY ORDER

Wolverine Electric Welded Steel Tube

—the dependable tube made by tube specialists

One of the best decisions you could make when ready to buy steel tubing for your condenser, heat exchanger and boiler installations is to specify Wolverine Electric Welded Steel Tube.

Here is a tube that is made by specialists—by skilled men who are devoting their entire working time to the development and production of tube—at it since 1916.

By consulting our Customer Engineering Service you can avail yourself of a vast background of tube experience that can help you with the selection of the right tube to meet your particular operating conditions. We invite your correspondence or call.

In all diameters from 1/4" to 3" O.D. in the following analyses: SAE 1010, SAE 1015, SAE 1020, SAE 1025, and SAE 1030.

ESTABLISHED 1916

WOLVERINE TUBE DIVISION
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Export Department, 13 E. 40th St., New York 16, N. Y.

General Electric Co., Dept. ST, Schenectady 5, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Antirust Paints

. . . available in colors

Rustrem antirust paints are available in red, gray and green in addition to the standard black, aluminum and clear. For use on all metals, both indoors and out, the colors are said to eliminate the necessity for a clear base coat except where other paints are desired as finish coats. Paint can be applied over rust without wire brushing, scraping or sandblasting. Speco Inc., Dept. ST, 7308 Associate Ave., Cleveland 9, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

Neoprene Coating System

. . . cuts maintenance paint costs

Neoprene coating system is reported to gain savings up to 50 per cent per square foot in maintenance painting and coating costs. The special formulations added to the manufacturer's corrosion resistant line are called NeoCoat and NeoPrime A for all surfaces except concrete.

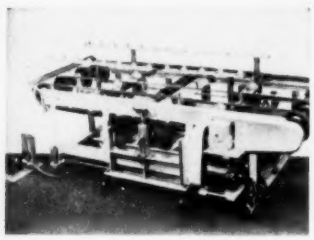
NeoCoat is a plastic, involving polymerization, in which the accelerator is included in the product. This eliminates necessity of mixing on the job. Polymerization takes place after the coating is applied. Pennsylvania Salt Mfg. Co., Dept. ST, 1000 Widener Bldg., Philadelphia 7, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Sheet and Strip Handler

. . . supports long, narrow pieces

Long narrow strips are supported during cutting operation by this sheet and strip handling machine. The Coilveyor can handle strips up to 6 feet long and from 20 to 48 inches wide. Air-operated plungers support the ribbon as it butts against a stop acting as a back gage.



As shear cut is completed, the cut ribbon or strip is lowered to the machine's conveyor belts and carried away. Plungers automatically return to support the next cut. Fried Steel Equipment Mfg. Corp., Dept. ST, 528 E. 119th St., New York 35, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Wet Blasting Machine

. . . built to clean small pieces

Small pieces that can be handled manually are cleaned and finished with precision by the model 30 Liquamatte blasting machine. Machine has a 30-inch square and 2-foot, 7-inch high blasting compartment. A 15-inch diameter rotating work table holds the work in the blasting compartment. Small portable aux-

Just because that bathing suit is proper at the beach, she shouldn't assume it's proper for the classroom, too!

And just because one bearing is best lubricated by one particular grade of oil, you shouldn't assume that the same oil is best for *all* bearings on that machine. In many cases it isn't.

OIL CUPS permit you to lubricate each bearing with the oil best suited to that bearing—thus prolonging bearing life, reducing maintenance costs, cutting down-time, boosting production. And oil cups fortunately *cost very little.*

Gits oil cups have been the standard for industry for more than 40 years. Gits Bros. has the largest selection of oil cups available anywhere. Call on Gits Bros. for a prompt, efficient solution to your lubrication problems.

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DIVISIONS OF ASSOCIATED SPRING CORPORATION

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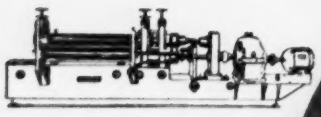
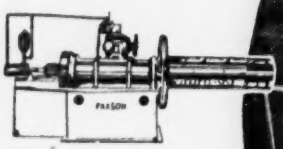
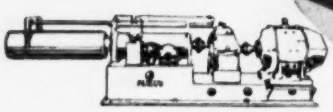


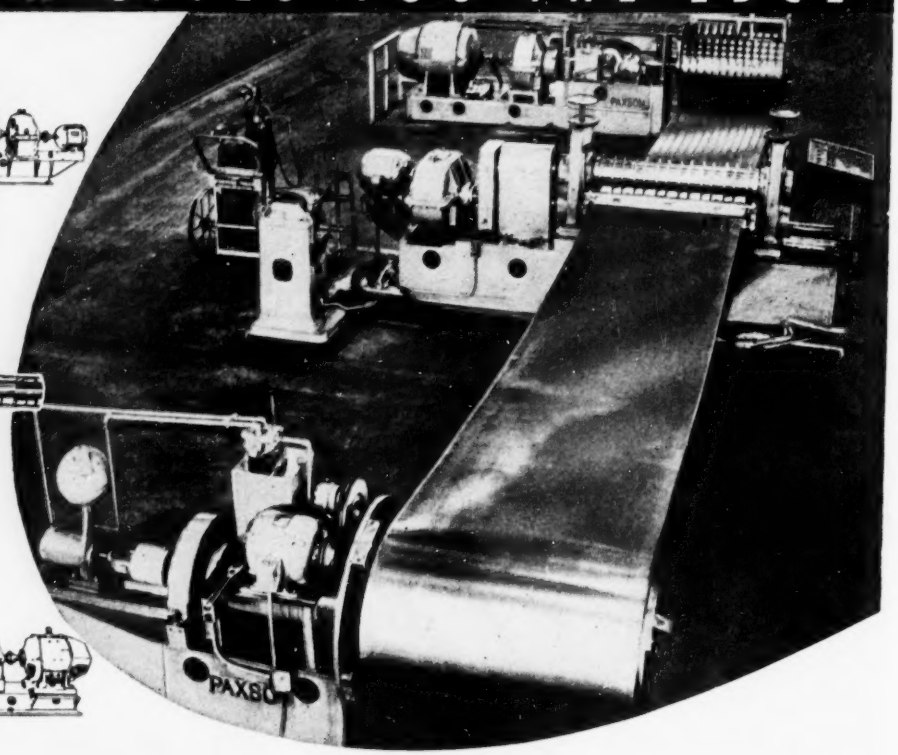
SLITTERS

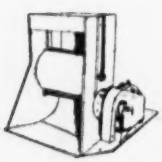


PAY-OFF REELS



COILERS





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2800 ft. E.W. runway and club house, private field 2 miles west of Salem, maintained for your convenience. Wire or phone arrival time. We will meet your plane.

Paxson Slitting Lines are giving top performance for leading manufacturers—coast to coast. Both heavy duty and general duty lines are custom built to meet specific needs . . . Capacities up to 40,000 lb. coils . . . Various power for any required total metal thickness up to 1½".

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Engineers and Builders of Cold-Rolled Strip-Mill Equipment
SPECIALIZING IN SLITTING LINES

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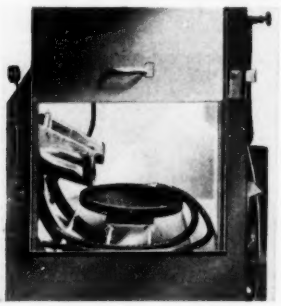
REMEMBER, ALL PAXSON LINES ARE CUSTOM BUILT

iliary tanks receive parts from the blast chamber for rinsing.

Flat surfaces, knurling, thin-walled sections and other vulnerable areas remain unchanged. Tolerances of 0.0001-inch can be



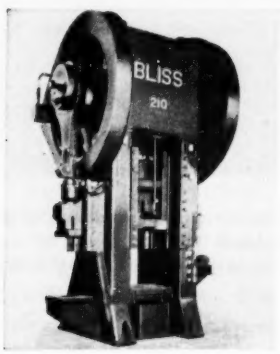
maintained where necessary. Pushbutton controls are located on one central control panel convenient to the work station. American Wheelabrator & Equipment Corp., Dept. ST, 1157 S. Byrkit St., Mishawaka, Ind.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Trimming Press Line

. . . box-type crown construction

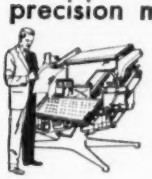
Streamlined box-type crown construction and a design that provides rigidity and operating quietness are features of this trimming press line. The single-geared presses provide four-piece frame welded steel construction with twin herringbone driving



gears running in oil and rim-type, oil tight gear guards. Model has air counterbalance concealed in the uprights, automatic lubrication and the manufacturer's friction-type clutch.

Press operates at 35 strokes per minute, with 440-ton ram capa-

Whether you make precision micrometers . . .

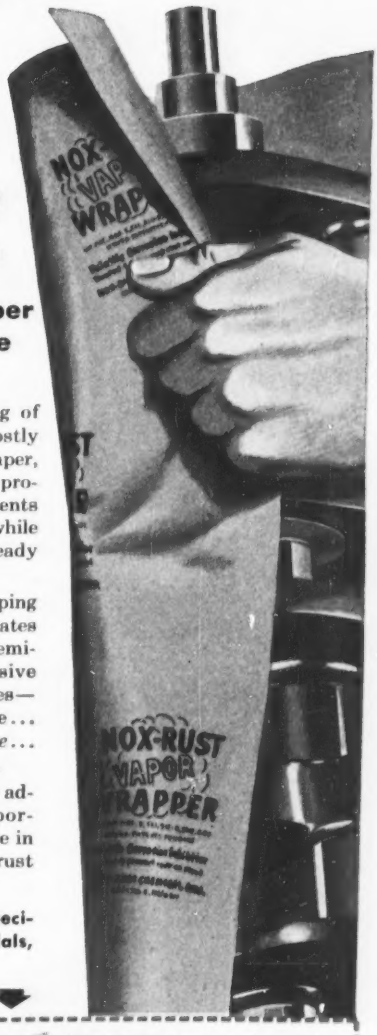


. . . or complex mechanical units, you can

Wrap Out Rust

-with **NOX-RUST Vapor-Wrapper**

New *Chemically Active* Paper Blocks Rust in One Simple Operation!



Vapor-Wrapper makes rust-proofing of metal products faster, easier and less costly than ever! Easy to use as wrapping paper, this remarkable rust preventive paper protects everything from delicate instruments to huge printing presses...cuts costs while delivering products "factory fresh," ready for use!

Vapor-Wrapper ends troublesome dipping with messy rust preventives . . . eliminates costly cleaning and degreasing. The chemical *within* Vapor-Wrapper—an exclusive development of NOX-RUST laboratories—makes moisture-laden air noncorrosive... *without the need for an air-tight package*... without deposits forming on the metal.

Many companies have discovered the advantages of using NOX-RUST Vapor-Wrapper. Cut costs and improve service in *your* business with this new, *proven* rust preventive method.

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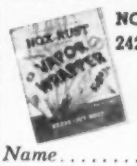

NOX-RUST Chemical Corporation
2427 S. Halsted, Chicago 8, Illinois
Please send me your booklet on Vapor-Wrapper, the rust preventive paper that *wraps out rust.*

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FOR PRECISION

PLUS PRODUCTION . . .

PRECIS-O-NIZING

OLD mass production methods are not enough to satisfy a market that is demanding both *quality* and *lower prices*.

Only through modern precision-production techniques can a manufacturer hope to use this two-edged sword to his own advantage!

Because of this need for a productive method of generating precision . . . the Microhoning process was evolved. For a quarter of a century the Micromatic Hone Corporation, working with industry, has led the honing field in the development of equipment that would productively finish parts within the ever-shrinking tolerances of new designs and standards.

This applied precision-adeptness of the Microhoning process is "PRECIS-O-NIZING".

In one economical operation Microhoning abrades stock rapidly and efficiently with a minimum of heat to generate—

—bores that are round and straight
—accurate diametric size
—a functional characterized (cross-hatch pattern) surface finish that is free of smeared or distorted material.

The processing of sewing machine parts is an example of PRECIS-O-NIZING.

Microhoning equipment is available to handle all kinds and sizes of parts . . . from soft non-ferrous metals to hardened steel and special alloys . . . from .078 to 60 inches in diameter and from ¼ inches to 75 feet in length.

MICROHONING = STOCK REMOVAL + GEOMETRY + SIZE CONTROL + SURFACE FINISH

PRECISION PRODUCTS MICRO MATIC TRADE MARK

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REPRESENTATIVES: Overgard Machine Tool Company, 234 Commonwealth Bldg., Denver 2, Colorado
Hallidie Machinery Co., 2726 First Ave., South Seattle, Wash. • REPRESENTATIVES IN ALL PRINCIPAL COUNTRIES

city. Friction clamp slip-type knockout prevents accidental die breakage. E. W. Bliss Co., Dept. ST, Canton, O.

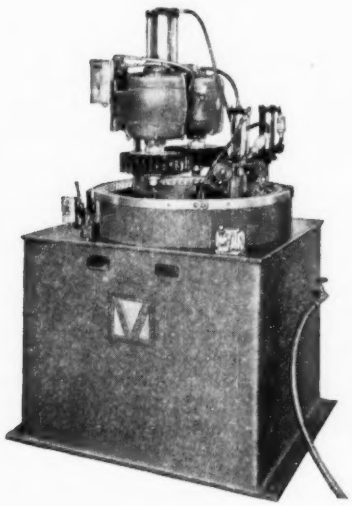
FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Turntable Deburring Machine

. . . holds accurate diameters

Turntable-deburring machine produces rapid deburring of compressor stator rings, half rings or other jet turbine ring sections. Sections are held to accurate diameter during deburring operation by interchangeable holding fixtures for different workpiece diameters. Modifications can be adapted readily for deburring other circular pieces.

Job records indicate a complete



cycle time of 1 minute for loading, deburring and unloading a pair of 32-inch diameter aluminum half rings. This is important, since some previous hand methods required an 8-hour shift to complete one set of 24 half rings. Grinding & Polishing Machinery Corp., Dept. ST, 2530-G Winthrop Ave., Indianapolis 5, Ind.

FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Profile Template

. . . profiles quickly obtained

Both male and female profiles are obtained quickly with the Ajusto profile template. It is composed of a number of hard brass strips, each one 0.007-inch thick, which permits close adjustment to practically any profile. Toolcraft Mfg. Co., Dept. ST, 6619 S. Dorchester Ave., Chicago 37, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Elapsed Time Indicator

. . . for limited panel space

HM2ET elapsed time indicator is designed for use where panel space is limited. The motor will start readily and operate continuously at temperatures ranging from minus 55° C to 85° C. The hermetically sealed device is available registering in tenth hour steps to 9999.9 or hour steps to 99,999. Marion Electrical Instrument Co., Dept. ST, Manchester, N. H.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

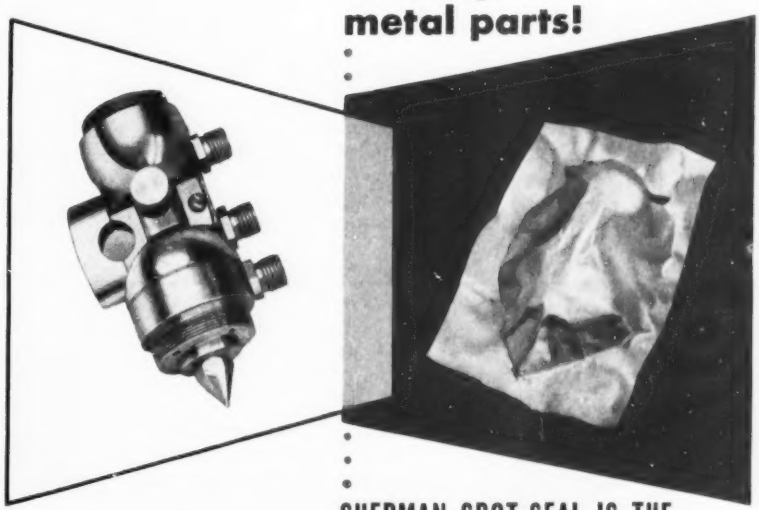
Tool Post

. . . fits all lathes

This tool post fits all lathes regardless of style of compound rest top. It is provided with five

New Way

to wrap metal parts!



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Goes on more easily than any other wrap, too. That's because Spot-Seal is a specially coated wrap that sticks only to itself. Wrap it around the part, press the sheet together . . . the part is sealed!

Spot-Seal answers the need for a quick, water-repellent, dust-proof, tamper-proof wrap, for one part or a whole assembly. Spot-Seal is ideal for assemblies like micro switches requiring dust protection, or loose parts which need a loss-proof wrap. Because Spot-Seal sticks only to itself, it will not mar finishes, requires no fastenings.

Switch to labor-saving Spot-Seal for convenient, protective packaging of metal parts, for shipping or storing. Write for free samples today, Dept. K. See for yourself the protection and quick-wrapping Spot-Seal gives.

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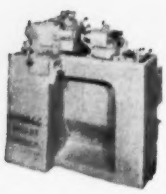
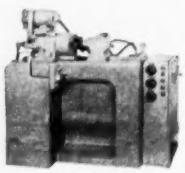
internal grinding



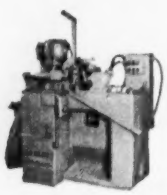
no. 1309-W

Finishes 2 bores and a taper straight and concentric. 2 wheelheads are used on this semi-automatic. Max. traverse stroke, 6". Max. grinding length, 3½".



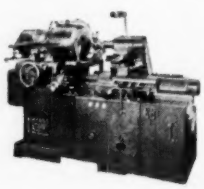
no. 1109

For high production of small bores where accuracy of size and finish are required. Max. traverse stroke, 6". Max. grinding length, 3½".



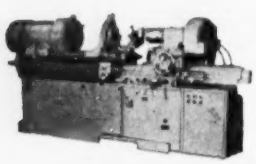
no. 2209

For precision and high production grinding of ball bearing races, gears, rolls, bushings, etc. Max. traverse stroke, 6". Max. grinding length, ¾".



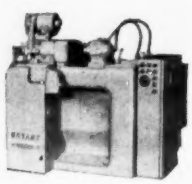
no. 1116

A general purpose hole grinder for tool room, small shop, or general production. Maximum traverse stroke, 20". Maximum grinding length, 8".



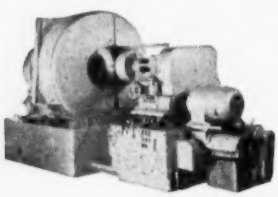
no. 1416

Specially designed for grinding bores in long work, such as machine tool spindles. Maximum traverse stroke, 20". Maximum grinding length, 8".



no. 1209

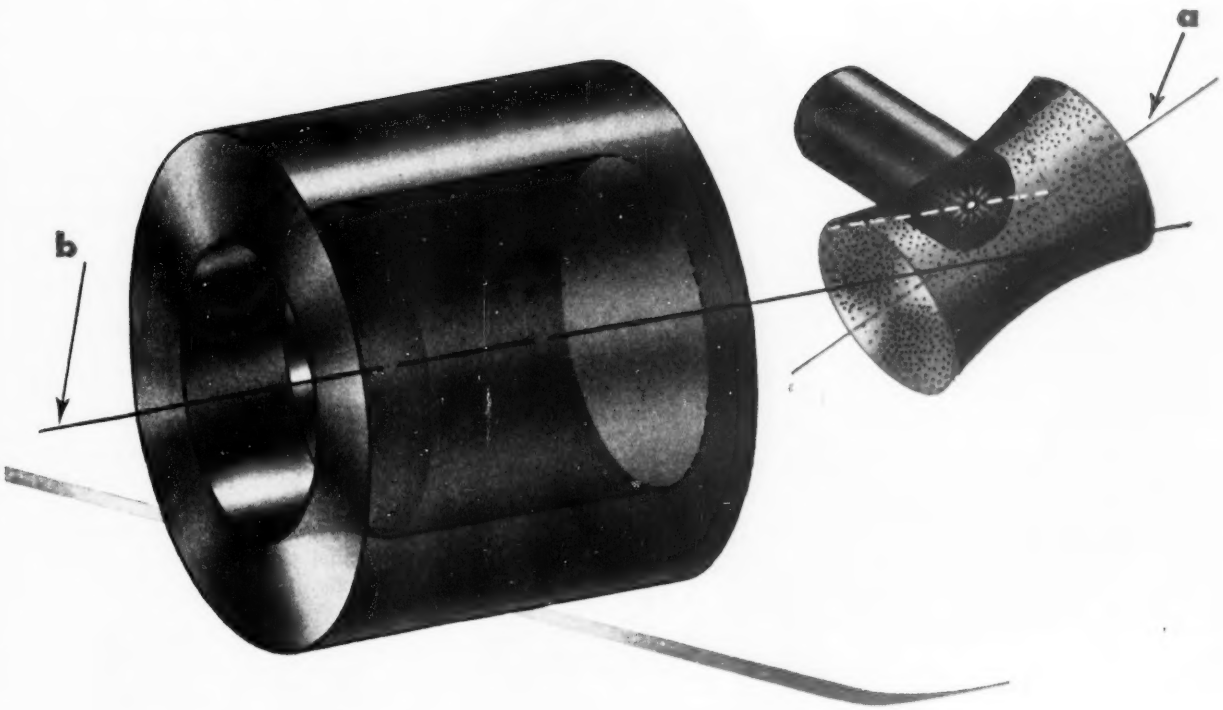
A fully automatic, high production machine for small and medium bore grinding. Max. traverse stroke, 6". Max. grinding length, 3".



no. 1460

For production or single piece hole grinding on parts up to 60" diameter. Max. traverse stroke, 21". Max. grinding length, 16".

"Alignment for Better Internal Grinding", a new, sound color moving picture is available for free showing to engineering groups. Write for descriptive booking form.



IT is generally believed in internal grinding that once the grinding wheel passes the diamond, the form of the wheel will be a perfect cylinder. In our illustration the wheel is tipped as it passes the diamond and an hourglass form is generated on the wheel. This condition is not peculiar to an internal grinder. The same form is generated in turning an O.D. on a lathe if the tailstock is either high or low.

The path of the diamond is a straight line across the surface of the wheel, but the wheel will not contact the work on the same straight line. Contact may be at a point on each end of the wheel. Since the wheel does not contact across its full face, wheel wear will be excessive and the wheel will act soft.

The geometry of the hole may be upset as in the illustration, with the result that the back of the hole will be tight. Neither turning the workhead nor changing the length of traverse will correct this error. Because the wheel is contacting at either one or two points, instead of a straight line, the surface finish will be poor. The remedy is to correct the alignment by bringing the wheel center line "a" parallel with the path of the wheel and in plane with the work center line "b".

Bryant Chucking Grinder Company
Springfield, Vermont, U. S. A.

Internal grinders • Internal & External thread gages

You're looking at a polished section cut from a Duraspun Centrifugal Casting...a casting with 12-14% chromium. It tells better than words of the high quality of Duraspun Centrifugal Castings.

You get a fine, dense, uniform grain structure. Possible air pockets and blow holes are eliminated. Tensile strength is higher than with static castings.

Order Duraspun if you need pipe or tubing. Sizes run up to 15 feet in length; up to 32 inches OD; and down to ¼ inch wall thickness. Odd shaped pieces can be produced providing a circular hole passes uniformly down the center. These, of course, require specially designed casting forms.

If, before ordering or asking us to quote, you would like to know more about our work and facilities, send for our Catalog 3150.

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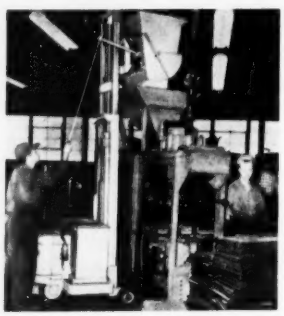
interchangeable tool holders for turning, threading, drilling, cutting off and boring. Tool bits can be resharpened right in the holder. A stud screw is provided on each holder for precision height adjustments. Posts are made with tool bit capacities ranging from ¼ to 1-inch and those of boring bars from ¼ to 1½ inches. Aloris Tool Co. Inc., Dept. ST, 80-82 Fourth Ave., New York, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 19

Foundry Service Truck

. . . expedites sand transfer

Small Hydroelectric model truck expedites sand transfer between two foundry machines. The truck will operate in very limited areaways and promises minimum capital expenditure with relation to



rider type cantilever trucks in this service.

Truck capacity is 1000 pounds; its total lift is 120 inches. It is powered by a 12-v battery with two motors, one for lifting, the other for the drive wheels. Lift Trucks Inc., Dept. ST, Cincinnati 14, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 20

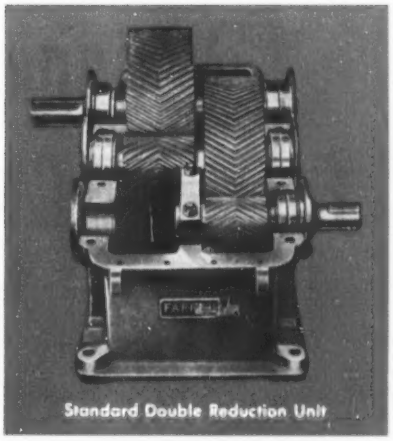
Torque Limiting Wrench

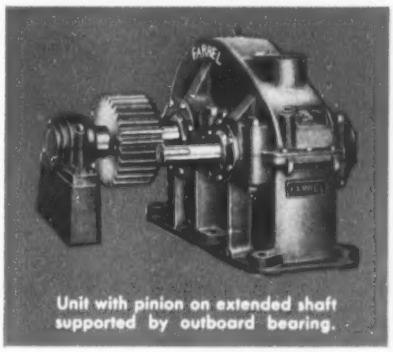
. . . releases automatically

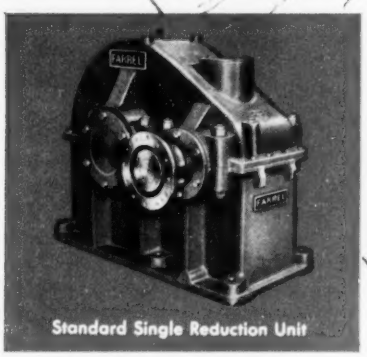
Precision torque limiting wrench releases automatically at proper setting. The wrench is not torque-indicating, so requires no dials, pointers, scales or sound indicators. It employs a fully-enclosed precision spring under compression as the principal torque-controlling element, using accurate micrometer-type adjustment.

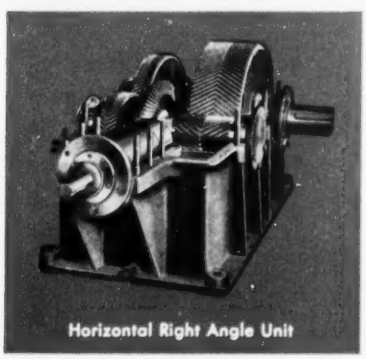
Models with a built-in reversible ratchet head are available to do

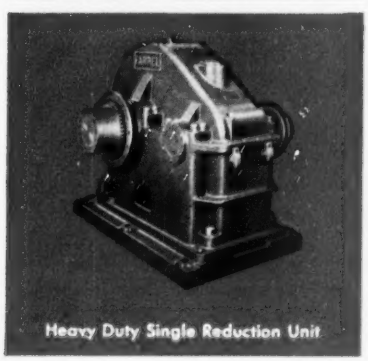
FIVE ANSWERS TO SPEED REDUCER PROBLEMS


Standard Double Reduction Unit


Unit with pinion on extended shaft supported by outboard bearing.


Standard Single Reduction Unit


Horizontal Right Angle Unit


Heavy Duty Single Reduction Unit

Farrel speed reducers are made in a number of different types, with a wide range of ratios and capacities. Designs include single, double and multiple reduction units, speed change units having two or more selective speeds, right angle drives, and drives to meet special requirements.

All units are supplied with precision gears, generated by the famous Farrel-Sykes process for smooth, quiet, efficient power transmission; shafts and bearings factored to safeguard against interruption of vital processes; gear cases proportioned to withstand repeated heavy peak loads; joints sealed to prevent entrance of dirt.

Send for further details of these designs. Ask for a copy of Bulletin 449 — no cost or obligation.

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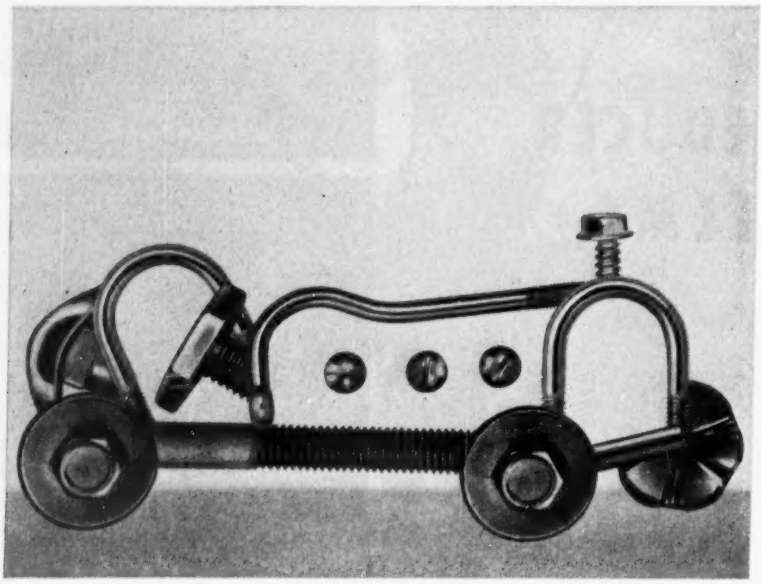

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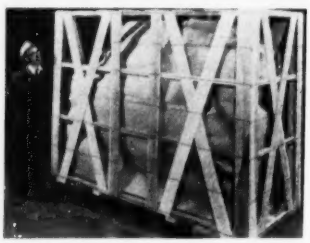
work of both ratchet and torque wrench. Plomb Tool Co., division of Proto Tools, Dept. ST, Washington & Santa Fe, Los Angeles 54, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 21

Large Wirebound Containers

. . . overcome size, weight limits

Heavy-duty wirebound containers overcome former size and weight limits for shipping large, heavy items. Illustrated is a wirebound container designed to carry



about 3000 pounds of equipment and weighing 35 pounds less than the former nailed-wood crate.

In addition to weight and time-saving in construction, container simplifies packing, unpacking, handling and storage. American Box Co., Dept. ST, 1900 W. 3rd St., Cleveland, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 22

Vertical Drum Lifter

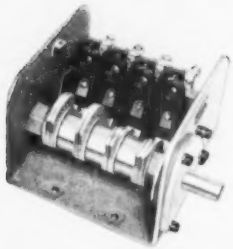
. . . handles open, closed drums

This vertical drum lifter, designed as a plant space saver, is capable of handling open or closed

drums. Its features include a safety barrel grip and all-steel construction with heavily welded chain. The model can be used for either high or low ceiling conditions. Palmer-Shile Co., Dept. ST, 16025 Fullerton, Detroit 27, Mich.

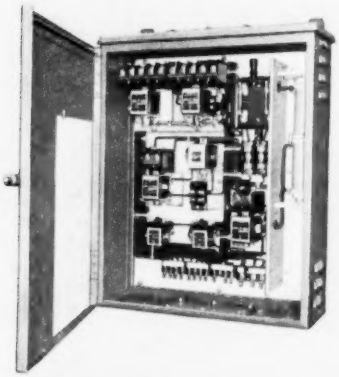
FOR MORE DATA—CIRCLE REPLY CARD NO. 23

Bulletin 705 Reversing Switch for small a-c and d-c motors

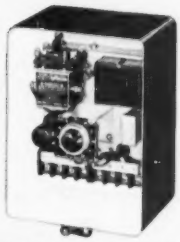


Bulletin 801 Rotating Adjustable Cam Limit Switch. Heavy duty

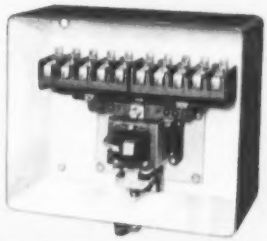
Bulletin 850 Motor Driven Timer for automatic process control



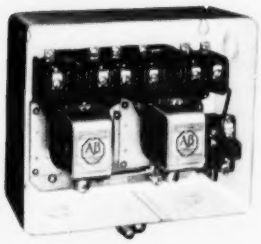
Bulletin 290R D-C Reduced Voltage, Reversing Starter for marine service



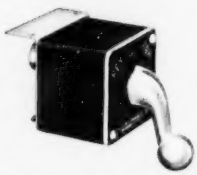
Bulletin 852 Electronic Time Delay Relay for precision timing



Bulletin 704 Nine-pole Permanent Magnet Contactor. Noiseless



Bulletin 205 Size 1 Reversing Switch for direct current motors



Bulletin 350 Drum Switch for reversing small a-c and d-c motors

Bulletin 365 Drum Controller for multispeed a-c motors

Some Useful Units in the

ALLEN-BRADLEY LINE

The standard Allen-Bradley line includes a wide range of solenoid operated across-the-line starters, combination starters, reversing switches, reduced voltage starters, and multispeed controls . . . not to mention an extensive variety of relays, contactors, and accessories.

And that is not all!

It also includes many other useful items . . . a few of which are shown here. They find application in the process industries, in marine service, in laundries, and in many other industries. All are designed for long, trouble free life and built to the widely recognized QUALITY standards that apply to the entire Allen-Bradley line.

If you use motor controls . . . it will pay you to become acquainted with the latest Allen-Bradley Catalog. May we send you a copy?

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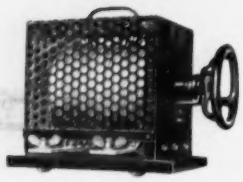
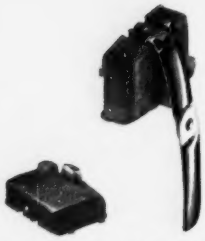
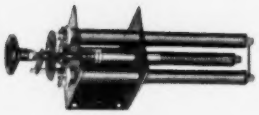


Bulletin 470 Graphite Disc Rheostat for laboratories

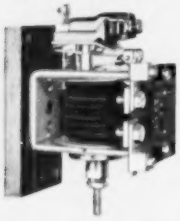


Bulletin 500 Knee and Foot Controllers for sewing machines

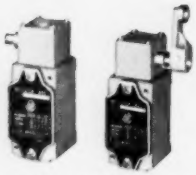
Bulletin 802 Foot Switch for heavy duty, rough service



Bulletin 410 Graphite Disc Rheostat for stepless control



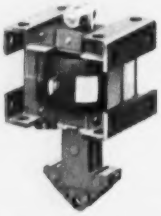
Bulletin 809 Instantaneous Current Jam-type Relay



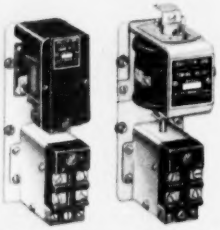
Bulletin 802 Limit Switches with various operating levers

Bulletin 600 Switch with overload breaker and pilot light

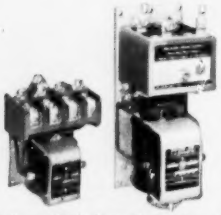
Bulletin 848 Dashpot Timing Relay. Maximum interval 30 sec.



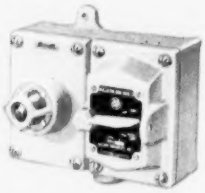
Bulletin 860 A-C Solenoid supplied in variety of ratings



Bulletin 849 Pneumatic Timers for machine tool service



Bulletin 202 D-C Contactors for applications up to 150 amperes

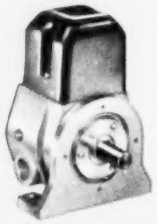


Bulletin 600 Watertight Starting Switch with pilot light

Bulletin 840 Float Switch operated by float and chain

Bulletin 800T Oiltight Push Buttons for machine tools

Bulletin 801 Rocker Arm Limit Switch for reversing service



Bulletin 808 Zero Speed Plugging Switch with magnetic lockout

Popular Accessories

in THE ALLEN-BRADLEY LINE

Above are shown a few Allen-Bradley control accessories. The variety of these units reveals the wide scope of the complete Allen-Bradley line. To machinery designers and plant engineers, the Allen-Bradley Catalog is a treasure house of standard control accessories which can be used in innumerable combinations to solve virtually any control problem. May we send you a copy of this Handy Catalog?

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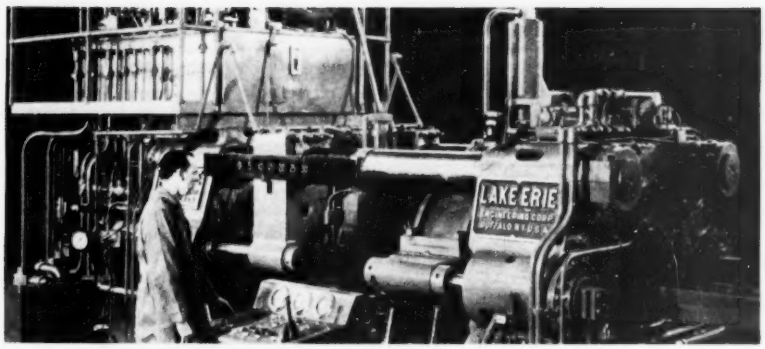


Elimination of gate lock and die runout table make this nonferrous extrusion press unusually compact for its 1250-ton capacity and give it rigidity

Extrusion Experience Yields New Design

Compactness, rigidity and quick die change are features of unit designed for handling softer aluminum alloys. The tougher alloys require slight reduction in billet size

FIRST job to be performed by the extrusion press designed by Lake Erie Engineering Corp., Buffalo, in a southwestern plant will be the extrusion of softer aluminum alloys like 61S for architectural use. It will handle billets 5 or 6 inches in diameter and 24 inches long. With a slight reduction in billet size the 1250-ton unit can handle the tougher alloys as well.

The press represents the combination of experience gained in nonferrous extrusion with the related fields of hot and cold steel extrusion. Its compact design permits a reduction in floor space requirements and increased rigidity due to shorter columns required. Additional advantages of the shorter stroke are increased speed and reduced maintenance.

No Delay—A swinging die arm makes possible the quick changing of dies by bringing the die to the front of the press. The die proper together with its backup block is enclosed in the die holder which is held in position in a horseshoe type construction at the end of the swinging arm. This design plus accessibility makes die change possible in a few seconds.

Main ram is connected to the moving platen which in turn carries the extrusion stem. The stem is carried on a vertical slide for moving out of the way during loading.

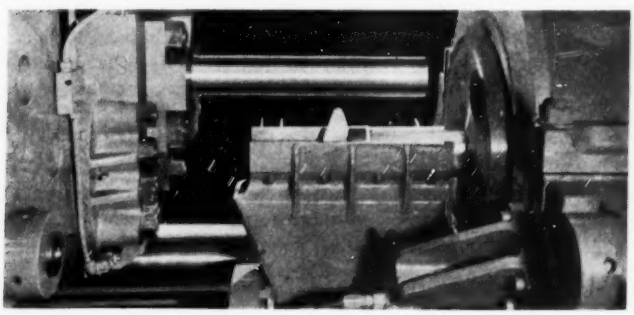
Two forged steel pullback cylinders are arranged with a double acting piston for the rapid advance of the main ram in addition to its return. The piston rams are fastened directly to the moving platen.

Sturdy Construction — At the other end of the press is the die platen connected to cylinder platen by means of four large columns. It carries the backup blocks to resist the pressure of the dies. Fastened to the top of the die platen is the vertical shear which has a downward motion to push off the butt end of the billet together with the dummy block at the completion of the working stroke.

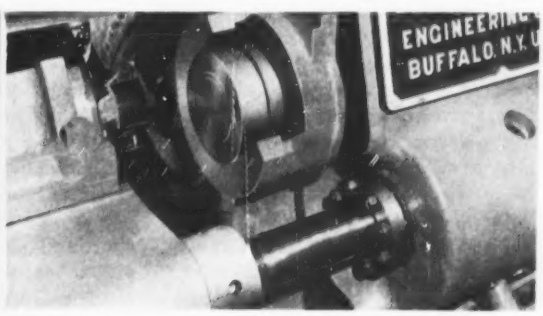
Container holder is split horizontally to permit easy removal of the container with its inserted liner. The container holder is mounted on angular guide surfaces which in turn rest on the two lower columns. Angular guide surface intersects the center of the press so that any expansion of the container will not affect the centering of the container on the centerline.

Mechanical Handling — Billet loader consists of a V-block mounted on an arm pivoted on the vertical centerline of the press. After the billet and dummy block pass into the V-block the arm is rotated, presenting the load to the centerline of the container. Another rotating arm pushes the dummy block and billet into the container and the loader is rotated out of position for the next billet.

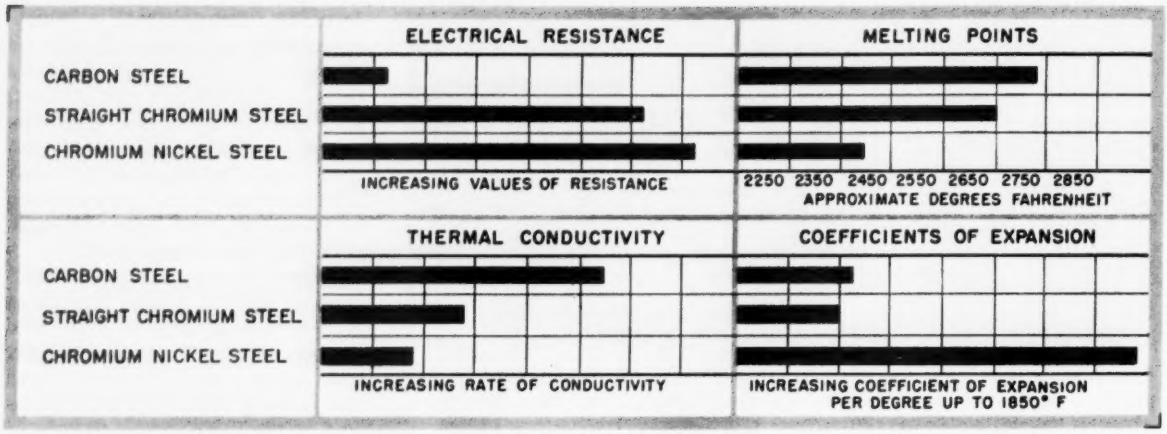
Tools consist of a container with its liner, the extruding stem die holder and backup block. The container is arranged with special electrical heating device to not only heat the container when starting a shift but also to maintain temperature as desired. Heating is by means of cartridges inserted in holes in the container proper.



Quick acting loader shown pushing billet and dummy block into container. Extrusion stem is in raised position



Swinging arm carrying die and die holder in out position ready for die change. Design cuts time required for job



Comparison charts show the wide differences in mechanical and physical properties of stainless and carbon steels

Welding Stainless Steels Has Its Problems

But with proper regard for the metallurgical and mechanical peculiarities of the alloys, troubles can be minimized. Here are some of the practical considerations

By W. G. BLACKWELL
Welding Department
General Electric Co.
Fitchburg, Mass.

SUBJECTING the various stainless steels to the heat of welding arcs poses some much-discussed problems. With mild or low-carbon steel, the welder's chief concern is the mechanical and physical properties. Welding of stainless steel includes not only these factors, but the task of preserving corrosion resistance and metallurgical stability.

You often hear men say that they must use lower heat or current when welding with stainless steel electrodes. They will also say that stainless steel plates buckle or warp much easier than plain steels. Why is this true?

Mechanical Properties—As the accompanying chart shows, electrical resistance of stainless steels is much greater than that of mild steels. The more resistance, the quicker the metal will melt. Therefore, less amperage is needed. Melting points of stainless steels are also somewhat lower, which also means less heat or amperage need be applied.

Another fundamental difference is in the matter of heat transfer. Being faster for plain carbon steels means that stainless steels retain heat for longer periods of time. Coefficient or magnitude of expansion for austenitic (chrome-nickel) stainless is much greater than that of plain carbon steel, so warpage or buckling may be worse. Expansion of straight chrome (ferritic or martensitic) stainless steels, however, is very similar to that of plain steel.

Metallurgical Changes — Carbide precipitation is the predominant metallurgical headache encountered when welding austenitic stainless steels. Stated briefly, the carbide precipitation causes the stainless to lose its corrosion resisting properties in the area of the weld. These heat-affected zones have, in effect, been robbed of their chromium. Extent of carbide precipitation is determined by the amount of carbon in the base metal or the weld metal and by the length of time the metal is held in the critical temperature range of 800 to 1550° F.

Three possible ways of reducing or eliminating carbide precipitation are recommended. First, use of stabilized base plate material and electrodes with added stabilizing elements prevents carbide formation. Another method is to use extra low carbon base plates and electrodes, and the third means involves increasing the cooling rate of the weld zone through the precipitation temperature range.

Stabilizing Materials — Columbium and titanium both have a strong affinity for carbon; thus they tie up the carbon present and leave the chromium distributed throughout the alloy. Columbium, though in short supply in this country, is used to stabilize electrodes because titanium will not transfer across the welding arc.

Base plates and electrodes with extra low carbon (ELC) contents are also available. The theory here is that with less carbon to begin with, there is less likelihood of trouble from formation of chromium carbide and subsequent loss of corrosion resisting abilities.

Controlled Cooling—Remembering that the amount of carbide precipitation formed is directly proportional to the length of the time spent in the temperature range of 800 to 1500° F, aiding the stainless to pass rapidly through this range is important. This can be done by using small diameter electrodes, lowest current possible, by making stringer beads instead of weaves, and by using chill bars

and holding fixtures. These practices will keep welding temperatures to a minimum.

Immediately after welding and while weld deposit is still above 1600° F, use air or water to cool metal to below 800° F. If facilities for post-heating the manufactured unit are available, carbon can also be dissolved by heating to above 1900° F, followed by a fast quench to below 800° F. This latter method can be used any time it is necessary to remove a carbide precipitation.

Straight Chrome Different—Effects of heat on the straight chromium stainless steels (where chromium is the principal alloy metal) is quite different than it is on the austenitic stainless steels. First, they are not subject to carbide precipitation; thus their ability to resist corrosion is not affected by the heat of the welding arc.

Breaking down the straight chrome stainless steels into groups according to their chromium content, they fall into the following classifications:

I. 3 to 14 per cent Cr —Martensitic
II. 14 to 18 per cent Cr —Martensitic or Ferritic
III. 18 to 30 per cent Cr —Ferritic

The metallurgy of these three is difficult to cover in detail in a discussion of this type, but we can list the things that are known about them.

Martensitic Group — This group is not subject to carbide precipitation, but does experience grain growth at welding temperatures. The resulting brittleness can be overcome by post heat treating. Heat treating is the usual course, though, since alloys in this category will air harden intensely.

Preheats and post-heats are used to slow down the cooling rate and avoid excessive hardening and prevent cracking. Because they do respond to heat treating, a considerable range of properties can be obtained from the same metal. Steels containing 2 to 9 per cent chromium are most used in applications requiring high strength at high temperatures.

Intermediate Group—Metallurgical reactions of this group depend on the exact relationship between the chromium and the carbon present. Those low in chromium and high in carbon would probably exhibit martensitic properties and, for all fabrication purposes, be considered martensitic. The higher chromium and lower carbon variety would probably be considered ferritic. Those that exhibit a balance between the two are sometimes preferred, as the soft ferritic constituents may reduce the cracking tendencies of the hard martensitic constituents when used in certain applications.

In the field it will be difficult to determine, even though you have the correct analysis, if the steel is martensitic or ferritic. If there is any doubt, your steel supplier will be able to tell you which of these intermediate steels you have purchased.

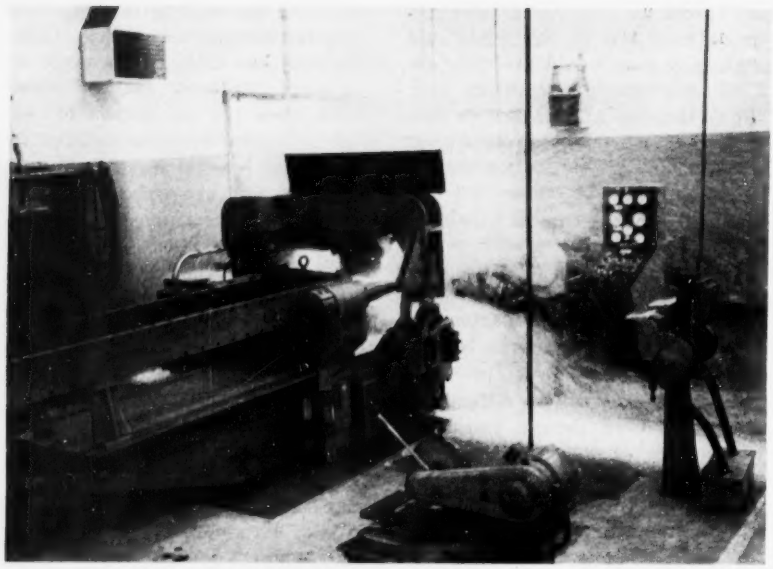
Ferritic Group—These steels are soft and ductile in the normal, or annealed, condition, but when subjected to the welding temperatures they can become very brittle. Cooling rate has little or no effect on ultimate hardness. On the other hand, they are not subject to carbide precipitation.

Welding temperatures above 1600° F and slow cooling below 1200° F will result in grain growth and brittleness. Once formed, the grain growth cannot be restored; but it can be minimized by low heat input and avoiding excessive heat buildup. Preheat of minimum 300° F must be used as weld zones and beads of ferritic steels are very brittle below this temperature.

The volume of straight chromium stainless used in industry is much smaller than that of austenitic or chrome-nickel steels. From the foregoing discussion, it is easily seen that fabrication problems of straight chrome stainless make it less desirable in most applications where a choice can be made.

EFFECTS OF WELDING HEAT ON STRAIGHT CHROMIUM STAINLESS STEELS

	METALLURGICAL STRUCTURE		
Characteristics	**Martensitic 4% to 14% Chromium**	**Martensitic-Ferritic 14% to 18% Chromium**	**Ferritic 18% to 30% Chromium**
CORROSION RESISTANCE	Not susceptible to loss of corrosion-resistance through intergranular carbide precipitation.		
HARDENING CHARACTERISTICS	Hardens in weld zone when cooled in air after welding.	Characteristics of this class fall on or between those listed for the other two classes depending on the comparative amounts of carbon and chromium present.	Do not harden even when cooled rapidly.
DUCTILITY OF METAL	Reduced by welding. Improved by heat treatment.		Reduced by welding. Improved some by annealing, depending on chromium content.
RESPONSE TO HEAT TREATMENT	Wide range of mechanical properties obtainable under heat treatment.		No range of properties obtainable by heat treatment.
EFFECTS OF WELDING ON GRAIN OF METAL	Subject to grain growth, causing brittleness. *Can be* restored by heat treatment.	Subject to grain growth, causing brittleness. *May be* restored, *may partially* be restored or *may not* be restored, according to metallurgical structure.	Subject to grain growth, causing brittleness. *Cannot* be restored. Must be minimized by low heat input. Employ fast cooling rate from 1200°F to below 800°F.
COEFFICIENT OF EXPANSION	Same or slightly less than that of plain carbon steel.		
HEAT CONDUCTIVITY	Varies from 70 to 40% of common steel, depending on chromium content.		
ELECTRICAL RESISTANCE	Varies from three to six times that of plain carbon steel, depending upon chromium content.		
MELTING POINT	Slightly less than that of plain carbon steel.		
WELDING	Use preheat and post heat treatments when welding.		
AWS ELECTRODE TYPES	AWS—E410-15 AWS—E502-15 AWS—E505-15	AWS—E430-15	AWS—E446-15



New Welder Hits Stride at Douglas

Jaws of this Taylor-Winfield 800-kva welding machine clamp tightly around a 12-inch metal tube during operating tests. Built according to Douglas Aircraft Co. specifications, the unit is being tested at that firm's Long Beach Division. Work will be on steel landing gear parts and struts for the Globemaster

How To Choose Proper Wire Sling

User must consider more than size of the load and length of the sling. Proper type can give longer life, better efficiency, and be easier and safer to handle

By WALTER C. RICHARDS
Chief Engineer
A. Leschen & Sons Rope Co.
St. Louis

HAVE YOU ever wondered whether the types of slings you have in use are exactly what you should be using? Even a sling user of long experience may become confused occasionally with the wide selection of slings available by types, constructions, sizes and makes.

A basic question is, of course, should a chain sling or wire rope sling be used. Both have their merits. Chain slings have historical precedence in many applications, but the use of wire rope slings has been steadily increasing in recent years. Use of one type or the other should not be based on precedent or habit alone.

Consider These—If it is determined that a wire rope sling will do a better job, there are six factors to consider before the type, size and length of sling can be specified:

1. Object of load—size, weight, shape, etc.
2. Working area—i.e., amount of headroom
3. Size and description of crane hook
4. Angle of inclination—vertical lift, or otherwise
5. Location and description of lifting lugs, if any
6. Plane of attachment of fittings.

With this information documented, your sling supplier can be of greater help in recommending the sling that will give the best possible service.

Types of Slings—Most common type is the standard single-part wire rope sling, suited for liftings (large or small) where the sling is attached to fixed rings or lugs and where sharp bends in the sling are not major considerations. They are available generally in sizes from $\frac{3}{8}$-inch to 2-inch diameters with various combinations of end fittings such as thimbles, loops, hooks, sockets, swaged sleeve loops, inlaid spliced loops and others.

Continuous strand or grommet slings are made of single length strand laid in place around itself to form a round 7-strand endless sling. Available in sizes from $\frac{1}{4}$-inch to $2\frac{1}{4}$ inches in diameter, they are generally more efficient than spliced-endless single slings because of the short lengths in which these slings are ordinarily used. Frequently grommet slings can be used without the need of forming loops or attaching fittings; they are ideal for sling hitches of various types. It is economical to have grommet slings available because of their ease of handling and variety of purposes.

Multiple Part Slings—Instead of using a single wire rope as the body of the sling, the principle here is to lace or braid ropes of smaller diameters into strong, flexible slings. One type is the flat-laced which is what its name implies—several parts of wire rope laced together to form a smooth, flat-bodied sling. Load pressure is distributed over a greater area, consequently these slings have strong gripping power with less wear on the sling and less marking of finished load surfaces.

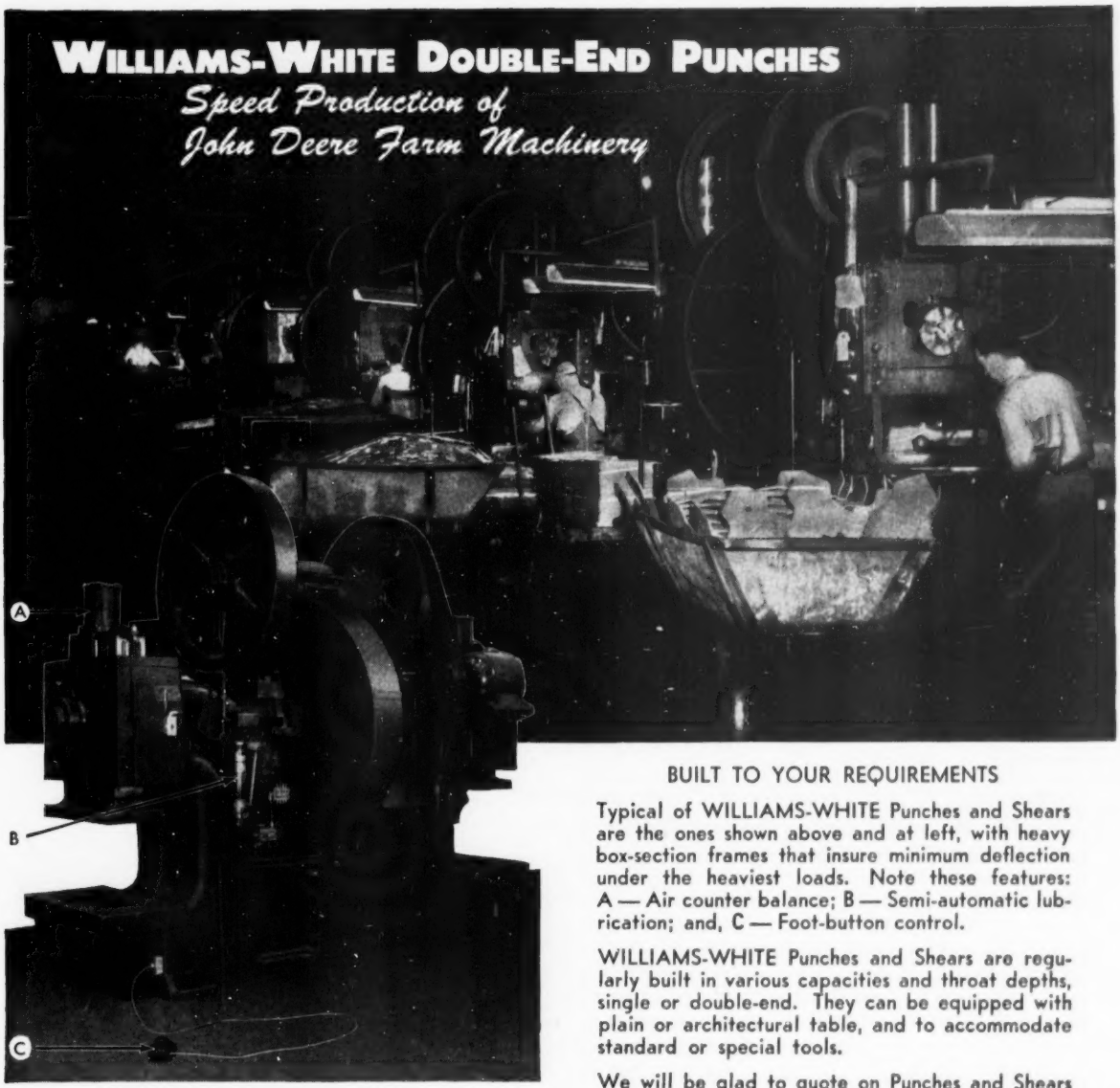
Braided slings consist of several parts of wire rope assembled into a round-bodied braid. Because of the braiding, there is less kinking tendency and internal tension in the sling is at a minimum. It wraps around a load easily and securely, without becoming "set" or deformed. Advantages of this type, and the flat-laced sling, are great load carrying capacity and flexibility for easy handling.

Check Economics — Standard wire rope slings cost less than the multiple part slings, but though you may find that you can use this lower-cost standard sling, cost should not be the determining factor. Longer wear, easier handling and greater safety can often mean greater long-range economy.

If you have any questions regarding the length or diameter of slings to be used, your supplier can help if he has all the details.

WILLIAMS-WHITE DOUBLE-END PUNCHES

Speed Production of John Deere Farm Machinery



BUILT TO YOUR REQUIREMENTS

Typical of WILLIAMS-WHITE Punches and Shears are the ones shown above and at left, with heavy box-section frames that insure minimum deflection under the heaviest loads. Note these features: A — Air counter balance; B — Semi-automatic lubrication; and, C — Foot-button control.

WILLIAMS-WHITE Punches and Shears are regularly built in various capacities and throat depths, single or double-end. They can be equipped with plain or architectural table, and to accommodate standard or special tools.

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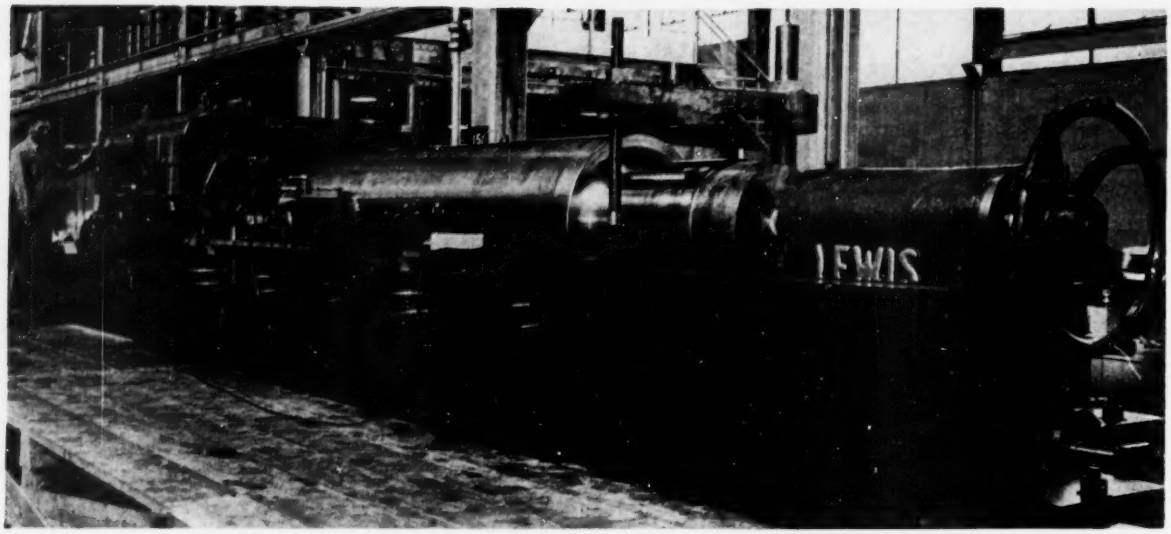


First commercial hydraulic roll lathe of a newly developed design for installation at Fairless Works, United States Steel Co., Morrisville, Pa.

Hydraulic Roll Lathe

Saves Time in Rough Machining

Infeed, traverse of tool and tail stock movement are controlled hydraulically to relieve operator of heavy manual work and reduce machining time 75 per cent

A NEW 60-inch hydraulic roll lathe, the first and largest thus far produced commercially, is to be installed at the new Fairless Works of the United States Steel Co., Morrisville, Pa. It was developed and built by Blaw-Knox Co.'s Lewis Foundry & Machine Division, Groveton, Pa. The machine is equipped with a 60-hp main drive motor with variable speed from 300 to 1200 rpm, and a separate motor for the hydraulic pumps. The latter are designed to maintain a pressure of 1000 pounds in each cylinder.

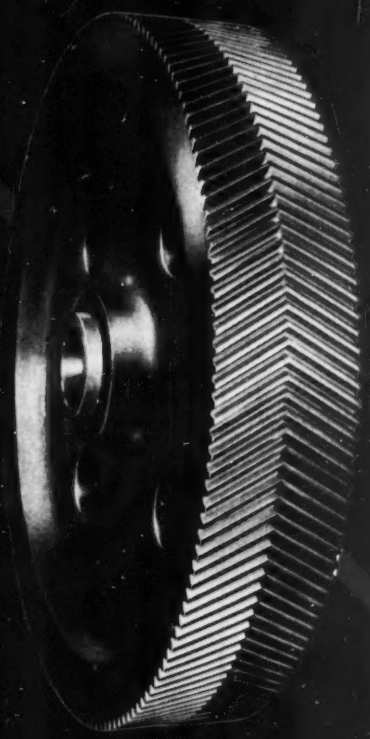
Use of hydraulic lathes has produced time savings up to 75 per cent in roll machining where substantial rough machining is required.

Reduces Manual Work—The infeed or bite of the cutting tool, the lateral movement or traverse of the tool, and the movement of the tail stock are controlled by hydraulic pressure. These features relieve the lathe operator of much heavy manual work, increase the consistency and uniformity of the cutting operation and produce savings in time. The new lathe has adjustable neck bearings, which make the bearing adjustment more true and reduce the demands on driving equipment, spindles and neck bearings.

Chief saving in time is achieved by converting the roll machining operation from what is essentially a manual, intermittent task to something approaching continuous flow. Roll lathes normally employ the plunge cut. After the tool is set up, the operator forces it into the face of the revolving roll with a feed screw; the pressure is maintained manually and enough revolutions are made until the desired depth of cut has been reached. The operator must make repeated measurements and control wedges at the side of the cutting tool to maintain squareness. Then the tool is retracted, moved over to its next position, and another plunge cut taken. The hydraulic lathe is equipped with a tool traverse carriage that introduces a continuous spiral, or what is known as a traverse cut. This not only eliminates considerable setup time, but the pressure is constant, thus minimizing variation and the need for adjustments.

Minimizes Shock Impact — The width of cut can be increased from a maximum of about 5 inches on manual roll lathes to as much as 8 inches in some cases. The infeed or depth of cut can be increased, as long as the tool material can "take it." This is because the hydraulic pressure is predetermined and constant, eliminating wobble; the constancy of infeed pressure reduces the hazard of shock impact that is so destructive to some of the modern cutting tools, such as the tungsten carbide tipped tools. The speed of cutting, that is, the revolving rate of the roll, can be increased where certain modern tool materials such as the carbides are

Enough said...



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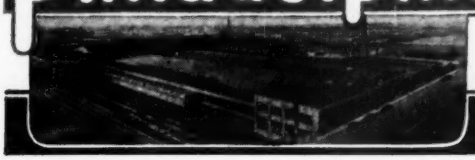

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Now is the time to order *your* Lindberg G-10 . . it's just the thing for today's complete and ultra-modern laboratory! Check these features of the G-10 . . features that make it a versatile, rugged and dependable unit.

Precision heating . . The model G-10 reaches and holds selected temperatures within plus or minus 1° F. at higher temperatures. Control is by a Lindberg "Lab-type" indicating controller pyrometer . . it's entirely automatic . . operates electronically.

Fast heating . . The 3000° F. top heating capacity provides any lower operating temperature desired (300° F. minimum), quickly and positively.

Uniform heating . . Heat is evenly distributed by 10 silicon carbide Globar heating elements . . equally spaced at top and bottom of the work chamber.

Compact, Self-contained . . The Lindberg G-10 is a "package" unit . . all you have to do is hook it up. All controls and equipment are in the furnace housing. Work chamber dimensions are 6″ wide x 12″ deep x 4¾″ high. And overall measurements are only 27″ from front to back . . 24″ wide . . and 56″ high.

The G-10 can also be used as a muffle furnace, or with carbon blocks for nonoxidizing atmospheres.

The Lindberg G-10 is a natural for your laboratory! For detailed information call your laboratory equipment dealer, or write Lindberg Engineering Co., 2450 West Hubbard St., Chicago 12, Illinois
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LINDBERG LABORATORY EQUIPMENT

Lindberg Engineering Company, 2141 West Hubbard Street, Chicago 12, Illinois

employed. Use of hydraulic pressure will permit the rough machining of certain hard surface rolls; formerly, such rolls had to be subjected to rough grinding, a costly operation.

The hydraulic lathe makes it feasible to operate several cutting tools simultaneously, perhaps one on each side of the roll or two tools working at opposite ends on the same side of the roll. The traverse carriage operates both from left to right, and right to left, again saving tool setup time. The roll is supported in the hydraulic lathe on adjustable neck bearings, eliminating the weight on the centers. This reduces center wear thus avoiding any recentering, and also the need for excessive grinding or finishing to achieve trueness. Moreover, the hydraulic control of the tail stock saves manual effort, reduces crane service, and contributes to safety.

Carbide Injection Summarized

Booklet discussing calcium carbide injection is offered in reprint form by Air Reduction Sales Co., division of Air Reduction Co. Inc., New York.

The 18-page article traces this metallurgical process for treating metals in the molten state through progressive stages of development in the laboratory and in customers' plants. Text is supplemented with diagrams, photographs, test curves and tables.

Copies of the reprint, ADR 81 may be obtained free from the company's sales offices or from the offices at 60 E. 42nd St., New York 17.

Boiler Tube Purchase Aid

A data card, designed to help in the purchase of welded carbon steel boiler tubing and cost estimation of equipment using this material, has been issued by Tubular Products Division, Babcock & Wilcox Co.

The card tabulates present prices per 100 feet of electric-resistance-welded boiler tubing in various quantity brackets. Seventy-seven popular sizes are shown in the table.

Copies are available upon request to the division sales offices at Alliance, O.

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parts: small connecting rods

alloy: "600" series metal, a high strength bearing bronze that contains no tin

quantity to date: over 2,000,000

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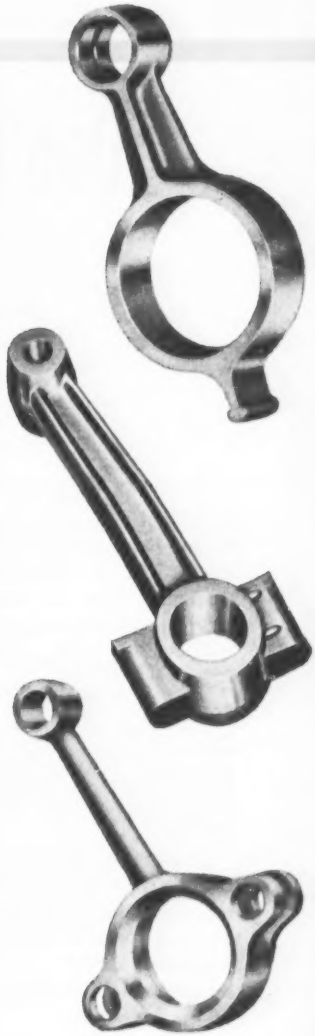
uses: compressors, outboard motors, small high speed gasoline engines. Best results are obtained if they operate against hardened, ground and polished shafts.



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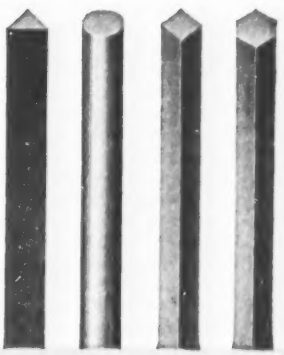

104

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Don't Write Off the Blast Furnace

Successful application of oxygen-enriched air in blast furnace practice is effected by recognizing variations in raw material thermal requirements and adjustment in operating practice

Part IV

By CHARLES E. AGNEW
Consultant
Blast Furnace and Sintering Plant Operations
Cleveland

INTRODUCTION to United States Patent No. 2,593,257, which was issued to J. M. Bradley and H. J. Ogorzaly, Apr. 15, 1952, gives the following details concerning the invention:

"The present invention relates to improvements in blast furnace operation. More specifically, the invention relates to the use of oxygen-steam mixtures of air for the blast of blast furnaces used for the production of pig iron from its oxides."

Production of furnace gas containing high percentages of carbon monoxide and hydrogen which may be used for synthesis hydrocarbon processes, or for other commercial purposes, is the admitted purpose of the invention:

"In accordance with the present invention, the blast furnace is charged in a substantially conventional manner with iron oxides, carbonaceous solids and limestone. The carbonaceous material is charged in a substantially higher proportion relative to the weight of the iron oxide, than corresponds to conventional blast furnace practice. For example, the amount of carbonaceous material charged may be about 150 to 300 per cent or more by weight of the iron content of the charge assuming a high quality ore which would normally require a carbonaceous charge amounting to about 85 to 100 per cent by weight of the iron. Quite generally the carbonaceous charge in accordance with the invention may amount to about one and one-half to three times, or more, of that used in conventional blast furnace operations. The blast consists of a mixture of oxygen, preferably about 95 per cent pure, with steam in a ratio of about 0.5 to 2.0 molecules of oxygen per molecule of steam.

"The oxygen reacts at the tuyere level and slightly above with a portion of the carbon[4] to form CO. The heat released by this extremely exothermic reaction exceeds by far the amount of heat required to heat the charge to the reduction and melting temperatures required for efficient pig iron formation. This excess heat supports the endothermic reaction between the remainder of the carbon and the steam to form substantial amounts of H_2 and additional CO. Thus an excess of reducing gases is formed over and above that required for iron oxide reduction and a gas rich in CO and H_2 enters the upper and cooler portions of the charge."

Includes Iron Oxide Addition — The remainder of the patent specifications describes the conception of using iron oxide in the top of the furnace as a catalyst for the production of hydrocarbons, and combining the production of pig iron with the production of gas to be used for other special purposes:

"It will be appreciated that this technique combines synthesis gas generation, hydrocarbon synthesis and pig iron production in one vessel, and since catalyst poisoning can be tolerated, it eliminates the necessity for apparatus to remove the sulphurous compounds in the gas and at the same time eliminates the energy losses attendent with such purification steps. Therefore, instead of having a steel company pay for a blast furnace to make pig iron and an oil company pay for equipment to produce carbon monoxide and hydrogen, to purify it, and to synthesize hydrocarbons from the purified gas, the invention permits all this to be accomplished in a single piece of equipment. Even if the blast furnace is so operated that hydrocarbon synthesis does not take place in the blast furnace, both hydrocarbon synthesis gas and pig iron may be produced in only one vessel."

With all due respect to the sincerity of belief in benefits expected from union of the two operations, the inevitable ill-effects to pig iron production reactions, and to the cost of production, which would accompany such union appears to preclude any possibility of either technical or commercial success with practical application of the conception.

Ignores Certain Reactions—Specifically, the presentation of thermochemical reactions, which occur in blast furnace operation, as described in the patent specifications, are confined to iron oxide reduction only, with total disregard for all the other reactions of raw material preparation and smelting, which are just as necessary but more difficult to effect than reduction of iron oxide.

Because of the complex nature of the various thermal, chemical, and mechanical reactions effected in blast furnace operation, it is difficult to conceive their successful

[4] This probably is a typographical error because it has been proved that C at tuyere level is first burned to CO_2 and then reverts to CO.

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consummation in the orderly manner, which is necessary for successful furnace operation, if they are combined with reactions of another distinct operation which apparently are as complex as the furnace reactions.

Because of the relation of coke cost to total pig iron production cost the conception of deliberately reducing the ore/coke burden ratio to the low ratio recommended in the patent specifications, and acceptance of the inevitable increase in slag production, in order to produce more gas, is not reasonable economically.

Because of the limited heat volume (Btu) produced from coke carbon combustion in a blast furnace (approximately 1/3 the potential) it is difficult to conceive of sufficient gas credits to justify acceptance of the inevitable high fuel rate which would accompany the recommended ore/coke burden ratio.

Expectation of passing the excessive weight and volume of gas, which would be produced with the recommended ore/coke burden ratio, upward through the light burden stock column, without prohibitive losses in flue dust and sensible heat with gas leaving the furnace top, is not reasonable, mechanically.

Reaction at the tuyeres of the oxygen-steam blast, and dissociation of steam, described in the patent specifications, conforms to the proved principles of that reaction but they are not complete in description of ultimate thermal effects upon furnace operation.

How Carbon Reacts—As previously described, carbon at the tuyeres is first burned to CO_2 an exothermic reaction generating 14,580 Btu/lb C, which then reverts to CO, an endothermic reaction consuming 10,210 Btu and leaving 4370 Btu/lb C available to the furnace. Dissociation of water vapor (H_2O) consumes 2868 Btu/lb H_2O[3]. The patent specifications imply that the consumption of heat for steam dissociation is supplied from the CO_2 division of the combustion reaction, but actually, so far as thermal effect upon furnace operation is concerned, it lessens the Btu available to the furnace after reversion of CO_2 to CO.

Production Dry Cleaning

Shown above is a section of the Cottrell precipitation plant at the Copper Cliff, Ont., smelter operated by International Nickel Co. Inc. Dust, containing small amounts of nickel and copper, is recovered at a rate of hundreds of tons daily and turned back into production. The 550-foot stack is one of two that height at Copper Cliff

As described in the patent specifications, H_2 and CO are formed with H_2O dissociation, thus increasing iron oxide reducing capacity. However, since every blast furnace operation generates CO in excess of its iron oxide reducing needs any addition to it would not have value in the furnace operation. Consumption of heat for the dissociation of water vapor contained in natural air or added to blast as steam, reduces the amount of heat available to the hearth. Since each pound of H_2O delivered to the furnace consumes 2868 Btu for dissociation the pounds of coke consumed per ton of iron for effecting the reaction can be calculated for any given blowing rate and coke of known fixed carbon content. In normal natural air furnace operations the detrimental thermal effect from dissociation of the variable water vapor content of natural air can be counter-acted with use of blast temperature so long as the amount of vapor to be dissociated does not exceed the reserve blast heating capacity. However, the deliberate increase of water vapor content to the degree recommended in the Bradley specifications would be beyond the capacity of blast heat to counter-act and would institute a direct charge against thermal economy. Since the dissociation reaction does not confer any benefit to furnace operation the cost of coke consumed in effecting it would be a direct charge against pig iron production cost.

Assuming some of the heat consumed for H_2O dissociation is returned to the furnace in the shaft with reassociation there of the water vapor components (H_2 and O), it could not confer benefit to furnace operation because inevitably the delivery of heat from the bosh to the shaft by the great weight of gas produced with the light ore/coke burden would be far in excess of the shaft operation needs; consequently, any heat restored from the reassociation of water vapor components would not only be detrimental to shaft operation but would add to the loss of sensible heat with top gas.

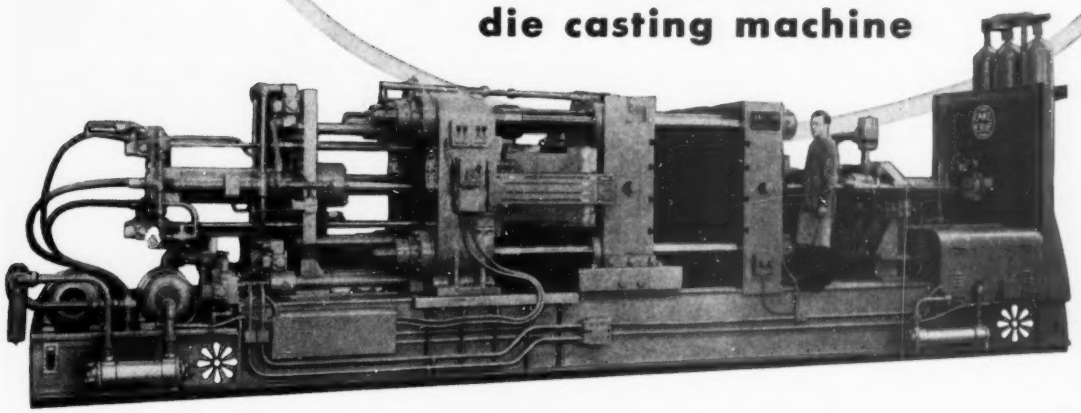
Viewpoints are Compared—The manner in which occupation influences thought is well illustrated by comparison of viewpoints and purposes in the Bradley patent and in United States Patent No. 783,044, issued to J. E. Johnson, in 1905. The Bradley patentees are engaged in the oil refining industry and obviously look upon blast furnace gas as a new source of hydrocarbons, which is their major interest. To serve that interest they propose to increase the CO, and H_2, content of gas leaving the furnace without giving proper consideration to effects from it upon the fuel rate required for the production of pig iron, or other ill-effects to furnace operation.

Johnson, who was a blast furnace operator, looked upon the production of pig iron with the lowest possible fuel rate as his major interest. In his patent specifications he conceived a means for filling the furnace in a manner which would keep the hot bosh gas, rich in CO, away from contact with coke in the shaft and force it to pass through ore and stone only. With this means he visualized a reduction in the fuel rate by consuming virtually all the CO contained in the

[3] "Use of Carbon in the Blast Furnace and Heat Balances" by T. L. Joseph and Kurt Neustaetter, *Blast Furnace and Steel Plant*, July 1947.

holding hydraulic fluid temperatures in check

in this new 1000 ton Lake Erie die casting machine



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For more facts, request Bulletin 1.1K5.

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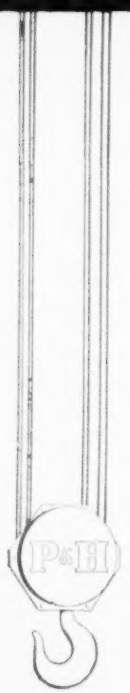

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Milwaukee 46, Wisconsin

bosh gas for the reduction of iron oxide, thus greatly increasing the CO_2 content in top gas leaving the furnace. Since the top gas then would have virtually no calorific value he proposed to use oxygen in the blast to increase the heat generation at the tuyeres as compensation for the loss of blast heat because there would not be any combustible gas available for heating stoves.

Since Johnson's conception occurred long before the U. S. Bureau of Mines research proved the coke carbon combustion reactions at the tuyeres his misconception of possibilities there is understandable. The importance of the observation is that in 1905, when the cost of coke was relatively low in comparison with iron-bearing materials, production of pig iron with the lowest possible fuel rate was an item of primary interest to the blast furnace operator. In 1952 that interest is magnified because the cost of coke is now relatively high in comparison with iron-bearing materials.

Status of Credits — Monetary credits from by-products processed separately from furnace operation are always most acceptable but the deliberate increase of by-product production within the furnace is not acceptable.

Because of the obvious ill-effects to furnace operation from an operating conception embodied in the Bradley patent specifications, the use of oxygen in the manner advocated could not have practical value for pig iron production.

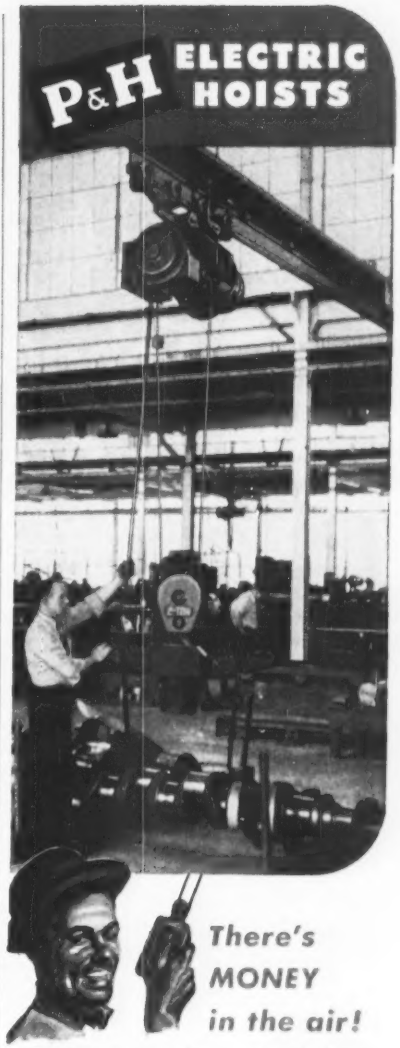
Specifications and claims in United States patent No. 2,602,027, issued to B. S. Old, July 1, 1952, are based upon the use of oxygen-enriched blast in conjunction with high-top pressure furnace operation, wherein the psi top pressure is used to control gas velocity through the furnace to a prescribed rate of linear feet per second. Claims are based upon the use of blast containing oxygen in a range approximating 25 to 40 per cent oxygen by volume. Obviously, the use of oxygen in the percentage range cited would have the same effect upon the stock travel rate, and consequently would effect similar operating phenomenon, as described in the Totzek operation.

High-top pressure operation would not alter the basic principles which govern coke carbon combustion at the tuyeres. Whether or not it has any effect upon the heat absorption rate of stock is open to question. It does not change thermal requirements for preparation of raw materials for smelting, or for the smelting. With a check in the gas velocity through the furnace less flue dust will be produced. To the extent of this reduction the ore/coke burden ratio is increased, with ability to carry the increase being determined by the capacity of the shaft to prepare more stock and the capacity of the bosh and hearth to smelt more prepared material.

Using this statement of operating principles as a premise it is reasonable to say that pressure operation cannot change the effects from the use of oxygen-enriched air compared to like effects with the use of natural air; therefore, the use of oxygen with high-top pressure, in the oxygen percentage range specified, would have the same effect as described for the Totzek operation.

Analysis on Negative Side—The foregoing analysis of patent specification theories is negative insofar as indicating any method favorable to the successful use of oxygen-enriched blast. The fact that there has been no publication of data proving the success from the experimental tests which have been made at full scale furnace operations in the United States and in Europe, is cited as supporting the correctiveness of the analysis.

Thermochemical reactions of blast furnace operation are many, each having their respective requirements of heat volume (Btu) and temperature (Btu concentration). Despite this proved truth all the theories analyzed overstress the relative importance of the iron oxide reduction reaction and entirely disregard all other reactions which also must be effected with iron oxide reduction in a blast furnace. All of them emphasize effects of oxygen enrichment upon heat generation but none give consideration to the means for heat distribution, or to change in the means for heat distribution when oxygen-enriched air is substituted



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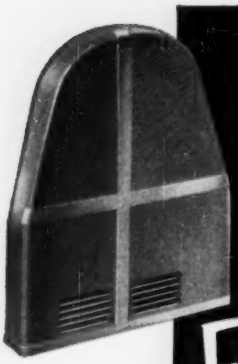

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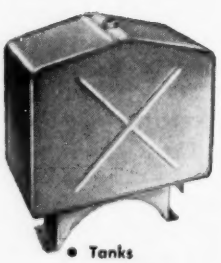

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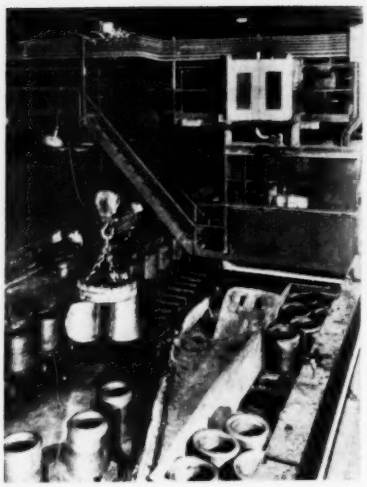

Cooling off a Hot Spot

Cleveland Works, Jones & Laughlin Steel Corp., used a crane cab cooler to cut cab temperatures from 150°F to 80-85° in summer; 68-72° in winter. The Dravo Corp. cooler is a split type because of limited space on the overhead bridge. Conditioner filters air, reduces fumes and heats or cools cab to the operator's need

for natural air, or to the vital need for equitable division of heat volume between the low-temperature reactions of raw material preparation and the high-temperature reactions of smelting. None of them recognize or give consideration to the vital relationship between the rates of heat generation, stock travel, and heat absorption by the stock. When consideration is given to these features of furnace operation it becomes readily apparent that the successful use of oxygen-enriched air for the blast is contingent upon the use of percentages of enrichment which can facilitate the application of basic blast furnace operating principles without distortion to the vital relationships between the numerous necessary reactions embodied in those principles.

Specifically, authoritative research has isolated the zones in the furnace where the respective reactions occur, and has measured the respective heat volumes and temperatures necessary to effect them. Because of these proved facts it should be obvious that the successful use of oxygen-enriched air for blast furnace operation is

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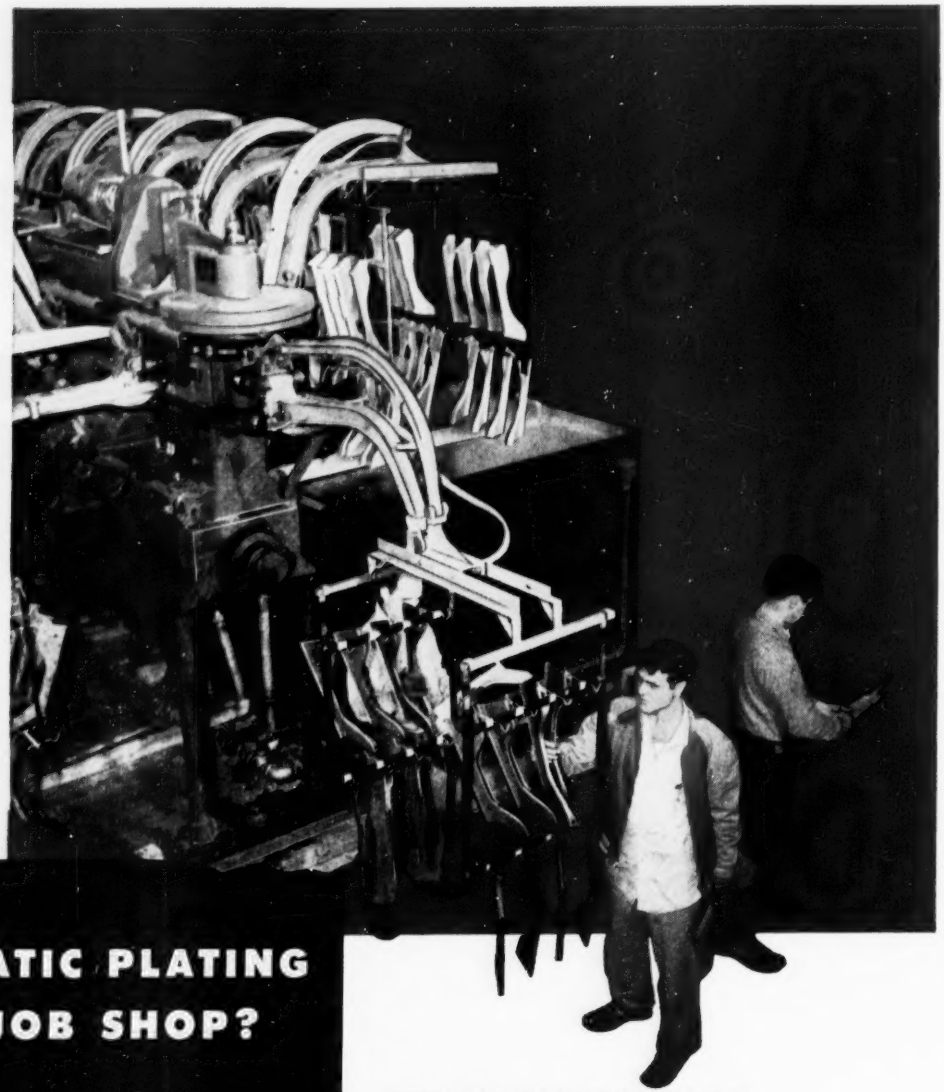

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not to be consummated with a change in furnace design but through the recognition of differences in thermal requirements for different classes of raw materials, and through the adjustment in operating practice methods, in order to serve the different thermal requirements in furnaces of present design. By so doing the proved advantages of the present design for serving basic operating principles when using natural air, can be enhanced with the use of oxygen-enriched air, and overall operating economy will benefit thereby.

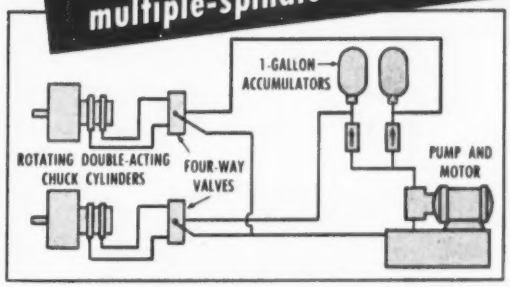
Importance of Processing—Obviously, the faster stock can be processed through the furnace the greater the production will be in a given unit of time. As actual operation conclusively proves, the difference in the rate of processing between a theoretical ideal blowing rate and a rate in excess of it which will permit controlled operation, does not exceed 5 to 10 per cent. With the excess blowing rate an increase in flue dust production and an increased loss of sensible heat with top gas leaving the furnace must be accepted. Although there is always an economic limitation to the acceptance of these losses they are incidental to the basic limitation caused by the relation between the stock travel rate and the stock heat absorption rate, since beyond a critical point reduction in the burden/fuel ratio will not correct the fault; only a check in the stock travel rate will suffice.

Since each 1 per cent substitution of oxygen for nitrogen in natural air blast increases the coke carbon combustion at the tuyeres (stock travel) 4.34 per cent, a 2 per cent addition of oxygen would increase it 8.68 per cent. Therefore, with the use of the theoretical ideal natural air blowing rate and 2 per cent oxygen enrichment the production advantage from maximum possible stock travel, otherwise obtained only with a rate in excess of the theoretical ideal, can be had without sacrifice in the losses of excess flue dust production and in the excess sensible heat loss with top gas disposal.

Because of the limitation to stock travel rate as determined by stock heat absorption rate, an

IMPACT for Chucking

GREER ACCUMULATORS deliver hydraulic SURGE on multiple-spindle machines



Greer Accumulators deliver the hammer-like blow on the chuck jaws required to seize and release work on automatic multiple spindle machine tools. In the above simplified, schematic diagram the Greer Accumulator not only supplies power for actuating the chucks but also maintains line pressure for holding the work securely. A low-volume, high-pressure pump charges the accumulator during intervals between chucking. Without the accumulator, a pump to deliver the required surge of fluid would have to be so large and costly as to be economically impractical.

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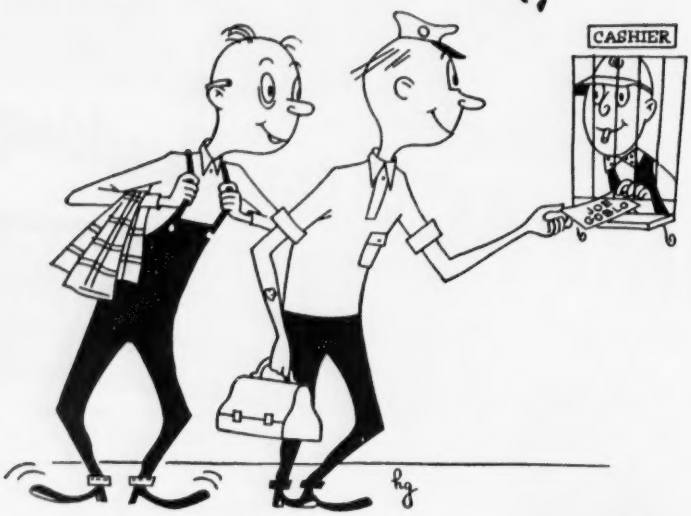

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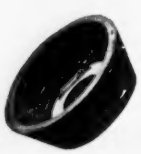

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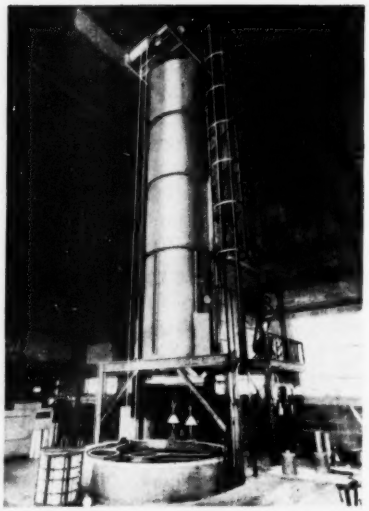

Solution for Light Metal

Heat treating installation made by Lanly Co., Cleveland, can be brought to 980°F operating temperature in 15 minutes, quenched in 8 seconds. Work in the vertical aluminum extrusion solution furnace is attached to a special cat head. Electric hoist raises and lowers the charge. Capacity reaches 700 pounds per charge

oxygen enrichment of 2 per cent is the approximate limit which may be used with the ideal natural air blowing rate. However, by decreasing the natural air blowing rate substantially below the ideal rate and enriching the decreased rate with oxygen to the proper percentage, the maximum possible stock travel rate can be retained, with a reduction in the weight of gas produced, a reduction in the loss of sensible heat with top gas disposal, and an increase in shaft raw material preparation capacity, because of reduction in gas weight and volume to be handled through the shaft and increased opportunity for heat recovery from the gas.

Amount of Blast Required—Weight of natural air blast required to produce a ton of pig iron varies with the character of raw materials used but it will always be 45 per cent or more of the total weight of materials charged into the furnace, and the weight of gas produced with it will always be 65 per cent or more of the total weight of materials discharged from the furnace. The advantages

to operating economy from the reduction in those weights, when they can be effected without sacrifice of production, are obvious. The rather common belief that certain air and gas volumes are necessary in order to hold the stock column in some degree of suspension is fallacious because of the frequently proved fact with slow blowing practice during the business depression of the 1930's when many furnaces were successfully operated on one-half to three-fourths of their normal blowing rates. With the reduced blowing rates the burden ratios carried were as heavy and sometimes heavier, as with the normal blowing rates. Generally, the fuel rates were lower. Thus the degree of stock suspension, which accompanies fast blowing rates, is a condition which can be accepted without injury but it is not a necessity.

During the past quarter century depletion of the better grades of natural raw materials (Lake ores and good coking coals) in the United States has forced widespread adoption of an operating practice which, although effective for increasing production, is unfavorable to operating and thermal economy.

Blast furnace operators with 20 years or more experience can remember when it was the rule, not the exception, to carry ore-coke burden ratios of 10 to 15 points higher than are carried at present. Two decades ago the ratio to each other of slag forming constituents of most Lake ore burdens permitted the formation of slag having chemical composition not far from the theoretical ideal—SiO_2 35.00, Al_2O_3 15.00, CaO 42.00, and MgO 5.00 per cent. Tapping slag having the chemical composition cited will have mineral composition in its respective stages of formation which causes a relationship of thermal conditions in the hearth and bosh (development of temperature head) which is favorable to the smelting reactions and therefore permits carrying the burden ratios cited. The truth of this statement may be verified at any furnace plant where past practice data are available for reference.

Resorts to Blending—With depletion of the better grades of Lake ores the lower grade ores

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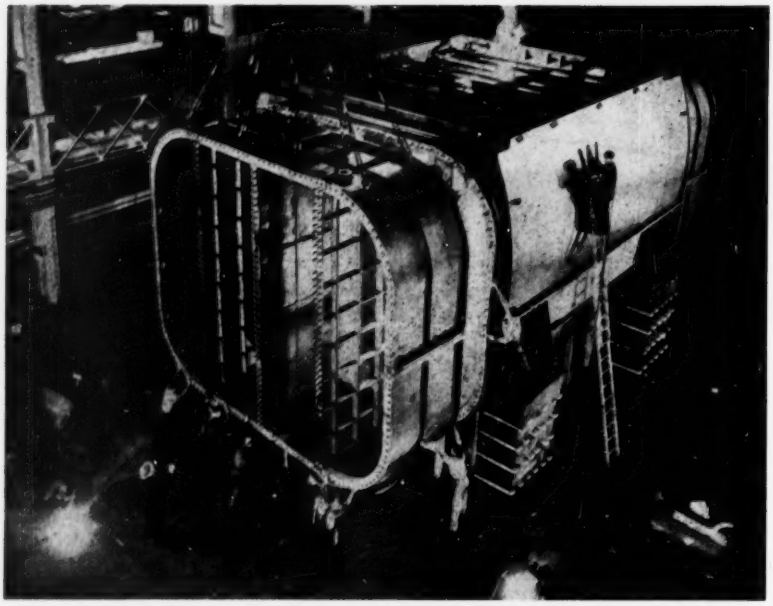


Power Booster for Consolidated Edison

Worthington Co., Harrison, N. J., is constructing this steam condenser to serve a 180,000-kw turbine generator Consolidated Edison operates at its East river station in New York. In this type of installation, a generator exhausting to the 125,000-sq ft condenser produces about 35 per cent more power

have been blended with better grades, or beneficiated through various means, in order to maintain a desirable iron content. Consequently, over the last quarter century, the iron content of ore shipped has not changed greatly but since equal consideration has not been given to the ratio of slag forming constituents contained in the ores, the chemical and mineral composition of slag produced in the furnace operation has progressively varied farther from the ideal composition. With the change in slag composition the relationship between thermal conditions created in the bosh and hearth are not as favorable to the smelting reactions as the ideal conditions; consequently, less burden can be carried. As previously mentioned, present ore/coke ratios of 10 to 15 points less than formerly carried are common. To compensate for the necessary use of lower burden ratios the practice of faster blowing has been generally adopted in order to increase stock travel through the furnace and so maintain desirable production rates.

As described, the advantage of the ideal slag composition is reflected in the thermal conditions which accompany it, or are created in the furnace with it. Where the beneficiation of low-grade ore to a chemical composition, which will permit the formation of slag to give the preferred thermal relationships, cannot be justified because of limitations of beneficiation processes and/or monetary cost, it is obvious if the ideal thermal conditions can be created through other means that the ideal slag chemical composition is not a necessity. Therefore, the ability to carry the 10 to 15 points of burden which has been lost with the deterioration of the ore-chemical composition, can be restored, with a proportionate increase in iron production and reduction in the fuel rate. It is this phase of furnace operation which appears to offer the best opportunity for the successful use of oxygen-enriched air.[5]

Theory, based upon proved practice phenomenon, indicates that the several factors of furnace operation involved in the problem, such as stock travel, heat transfer, mineral composition of slag, equitable division and consumption of heat volume, and ratio of preparation to smelting capacities, as effected with the use of oxygen-enriched air, can be corrrelated without conflicting with basic principles of blast furnace operation.

Applicable to All Ores—Change in chemical composition of Lake ores of the United States have been used for illustration but the principles involved would apply with equal force to European ores, or to ores from any other source.

Since heat is the agent which effects all thermochemical reactions of blast furnace operation any contemplated change in furnace design must recognize and consider the basic advantage to thermal economy which is embodied in the 2-stage principle of operation, and the furnace design which favors it.

Since reactions of the raw material preparation stage can be effected at temperatures lower than are required for the smelting stage reactions, they are effected to a substantial degree by waste heat salvaged from the smelting stage which otherwise would be lost to the atmosphere through radiation. Any change from this basic advantage is a backward step in furnace design and should serve as a warning to American ironmakers not to tinker with the necessary relationship between raw material preparation and smelting capacities.

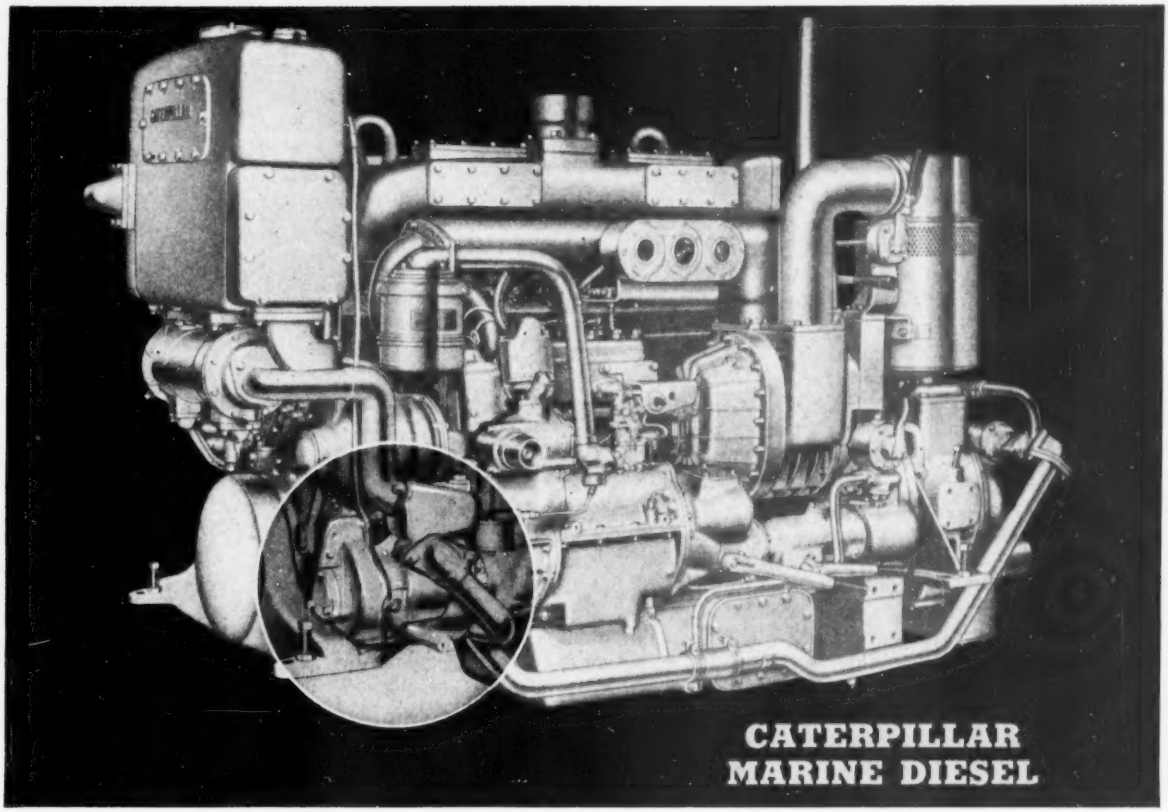
[5] Application for patent has been filed covering means for correlating blast furnace reactions with the use of oxygen-enriched air.

Machine Line Expanded

Announcement is made of two new automatic machines added to its line by Warner & Swasey Co., Cleveland.

Small six-spindle automatic machine will be furnished only as a bar machine according to present plans. Basic principles of the W&S line of five-spindle machines are incorporated in the new design. Standard attachments for the machine will also be available.

Second of the new machines is a 2-AC single spindle chucking lathe. Its design is based on that of the 1-AC single spindle automatic, but as the number implies, it will boast a larger capacity. New machine will take either a 10 or 12-inch chuck.



National Bearing Castings Help Cool "Cat" Engines

National Bearing Division's foundry skill permitted a new design in pump efficiency and compactness.

This extremely compact 170 horsepower Marine Diesel Engine, with special coolant pump, is a new design in efficiency by Caterpillar Tractor Co., Peoria, Illinois, makers of famous "Caterpillar" Diesel Engines, Tractors, Motor Graders, and Earthmoving Equipment.

Unusual size restrictions were specified in the coolant pump housing. It had to be of tough, durable bronze, highly resistant to corrosion by raw sea water, and painstakingly cast as the housing component for a very compact coolant pump, capable of delivering 100 gallons per minute. The housing casting design was unusually intricate, with wall thicknesses exactly ¼" in some areas, 7/32" in others. The mold for each casting required *14 cores*—all perfectly positioned, as the slightest misalignment would be ruinous. And, housings had to be cast to minimize machining.

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PLANTS IN: ST. LOUIS, MO. • MEADVILLE, PA. • NILES, OHIO • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

No Edge Preparation

Fillet and butt joints, square without edge, are welded by manual hidden arc

WATER TANK dimensions that precluded indoor assembly proved an opportunity for demonstrating the merit of hidden arc welding without edge preparation when Optenberg Iron Works moved the job outside. The tank is 17 feet 4 inches diameter, 11 feet 9 inches high, one of three nonpressure types Wisconsin Power & Light Co. will use for storing distilled water at its Edgewater Power station in Sheboygan.

After various sections were formed they were joined by tack welding, then placed on rolls to permit downhand welding of all joints on top or inside the tank.

A 400-amp welding generator stationed on the ground near the tank served the dual purpose of providing power for preliminary tack welding and subsequent shielded arc seam welding.

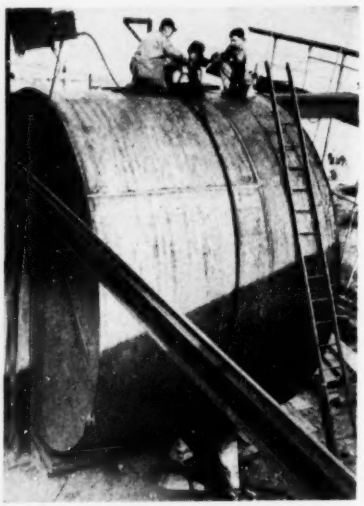
No Edge Preparation—Steel used in the tank is SAE 1020—the bottom head ½-inch thick, shell and top ⅜-inch. Fillet and butt joints were square without edge preparation, welded from both sides with Lincoln Electric equipment.

High current density makes a penetrating arc that left all welds with complete penetration. Outside bead seams were welded first. Design that permitted a 5/16-inch fillet weld on both sides made joint preparation unnecessary. Head diameter was larger than circumference of the shell.

Interior Procedure—To weld the inside head seams, workmen lowered a complete welding unit through a manhole to the tank interior. One man handled the equipment, another acted as operator as the tank turned through the rolls at 20 ipm. They worked in 5-foot stretches, the operator simply holding his gun and moving along as the tank turned. At the end of each 5-foot stretch, work stopped while the operator moved up for another run. Shielded arc equipment rolled along the tank curvature and no difficulty was met from having the automatic head at close range.

Center butt seam was welded in a similar manner, except the inside pass was made first because of poor fit-up.

Stationary Positioning — Hauled out of the tank, the welding unit was positioned on top, simply hanging from a gin pole. By laying a ladder across the tank and securing it to a supporting beam the tank could roll in either direction while the operator sat on the ladder and remainded stationary.



HIDDEN ARC GOES OUTDOORS
. . . tank turns at 20 ipm

Fillet welding rate reached twice normal hand welding speed; butt seams on the shell were completed five times faster.

Air Press Hole Sizing

Mead Specialties Co., Chicago, reports Atlas Metal Stamping Co., Philadelphia, has devised an effective method to size three holes in a gear box and cover plate, using two Mead model 122 air presses. First step in the operation calls for placing the cover plate or gear box in a registered position in a jig. Hardened ball bearings are then placed in respective plate or box holes.

When ram decends, pins in the upper half of the fixture force the balls through the holes, bringing holes up to true diameter. Balls drop into slots in the lower part of the fixture, ready for the next cycle.

KRANE KAR CAN CLEAR LOW SHOP DOORS!
SWING-BOOM CRANE

VERSATILE YARD CRANE LIFTS, SWINGS, AND SPOTS MATERIALS— INDOORS AND OUTDOORS

Carrying Large Gear Through Shop Door at Bucyrus-Erie Plant, Hibbing, Minn.

1½, 2½, 5, 10, & 12½ Ton Cap.

Powerful, compact **KRANE KAR** moves materials through doors 8 ft. high, 8½ ft. wide! Amazingly flexible, reaches for loads behind stockpiles, over walls and sides of RR cars, below ground-level, more than 30 ft. high. Simultaneously travels, swings boom, raises/lowers load. Combined with many safety features, stability without stabilizers, superb traction on all types of terrain, **KRANE KAR** is the most economicc! Yard Crane you can buy. One manufacturer reports Monthly Savings of $478.03. *Ask for Bulletin No. 79A.*

Gas or diesel, 9 to 37 ft. booms or adjustable telescopic booms, pneumatic or solid rubber tires; clamshell buckets, electric magnets, all-weather cabs, and other accessories.

USERS: Republic Steel, American Steel & Wire, Carnegie-Illinois Steel, Lima Locomotive, Food Machinery, etc.

Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment . . . LIFTRUK Fork Lift Trucks, KARRI-GO Front-Boom Cranes . . . Cranes for Motor Trucks . . . Capstans and Single and Double Drum Winches.

SILENT HOIST & CRANE CO. 849 63rd ST., BROOKLYN 20, N.Y.

You know his first concern is you...

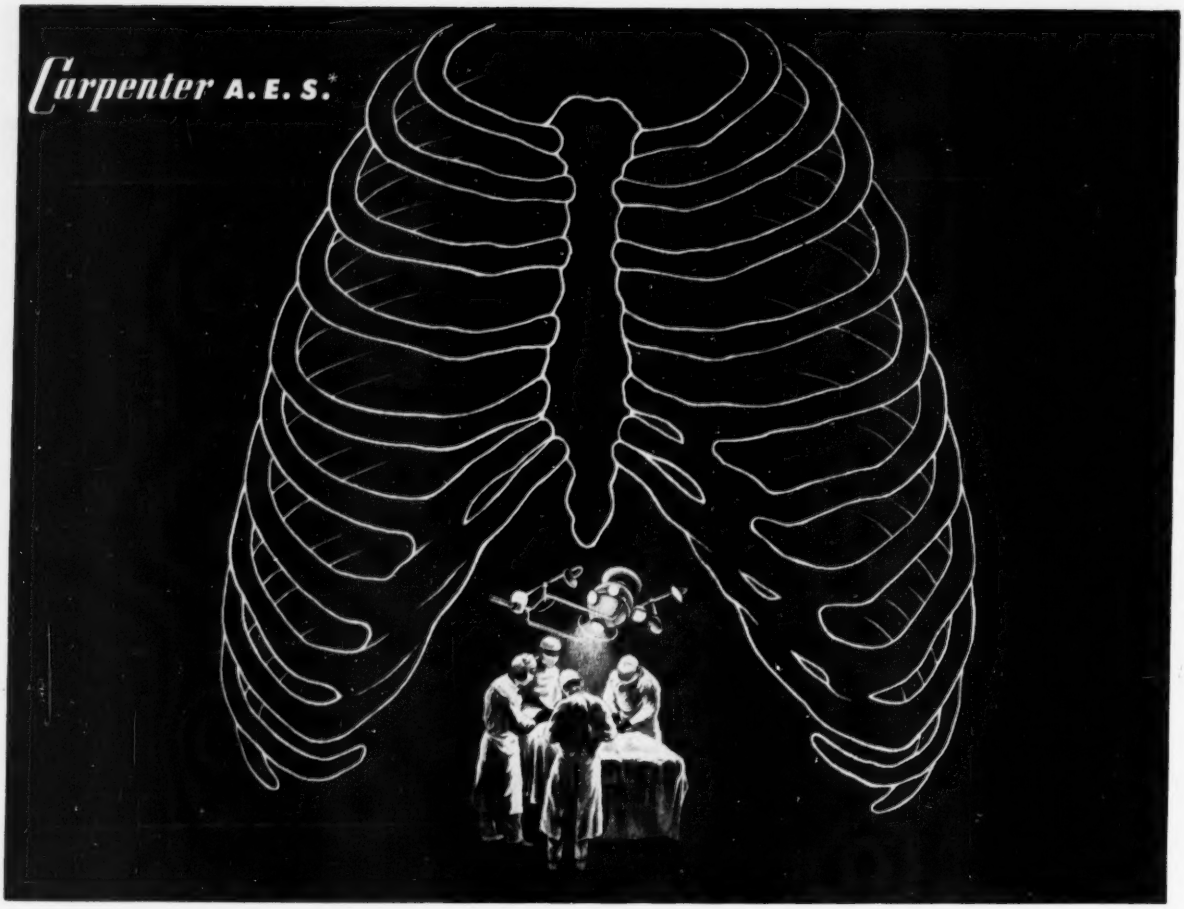
CONFIDENCE is born in one look at the eyes... the set of the shoulders..."the cut of his jib". In a second, you *know* he's had years of training and weathered it well. You know you couldn't be in better hands... and if anyone can get you there, *he will.*

Yes, it takes years to build confidence like this, in any line. And the whole organization of Bristol Brass ... young yet experienced ... is keyed to keep the confidence that any promised shipment of Bristol Brass sheet, rod, or wire will get there at the promised time, if it's humanly and mechanically possible to do so. In fact, that's what "Bristol-Fashion" means ... a term still in use that came to be first applied to the old clipper ships out of Bristol, England ... always shipshape, correctly manifested, *and right on time.*

. . .

The BRISTOL BRASS CORPORATION, makers of Brass since 1850 in Bristol, Conn. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

"Bristol-Fashion" means **Brass at its Best**



"Stretching" Human Ribs for Better Surgery

Another example of how Carpenter ***Application Engineering Service** *is working for industry*

Look down a long hospital corridor late at night. A soft light gleams over the operating room. Inside, skilled hands, working with modern instruments, are prolonging another life. And one of the instruments often in use is a rib spreader . . . employed to separate ribs in the human body during a chest operation. A vital part of the spreader is the rack that supports the two jaws. It must have strength to remain rigid when the patient breathes heavily under anaesthesia. Its finish must be bright, smooth, sanitary. Above all, it must be *available* to meet the needs of many hospitals.

The manufacturer first tried an ordinary Type 416 Stainless Steel to make the rack. But because of difficulties in machining, he couldn't produce the spreader fast enough to fill critical orders. Here is how Carpenter **A**pplication **E**ngineering **S**ervice paid off. Carpenter Stainless No. 5, Type 416 was recommended . . . a *free-machining* Stainless invented by Carpenter some years ago. With No. 5 the manufacturer upped production *25%* and obtained more uniform hardening qualities in heat treatment.

Here is just one more case wherein industry has found a way to make better products and hold down costs . . . with the help of Carpenter **A**pplication **E**ngineering **S**ervice. A.E.S. is yours to profit by when you do business with Carpenter. THE CARPENTER STEEL CO., 139 W. Bern St., Reading, Pa.

Carpenter STEEL — **Tool, Alloy and Stainless Steels**

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

The Market Outlook

DEMAND for steel, as a whole, is strong, but there are some exceptions worth watching. It's impossible to say now whether they are merely isloated instances and temporary or whether they are forerunners of things to come.

WATCH WAREHOUSES—Segment of the steel business where they are most in evidence is the warehouses. While they haven't been able to get as much steel as they would like, they have fared pretty well under the government's Controlled Materials Plan. Also, with warehouse prices for steel being higher than mill prices, some mill quantity buyers who have been going to warehouses for additional supplies are calling there less frequently. Now, Boston warehouses are not placing orders to extent of their allotments on some products, including small cold-finished bars, strip, light plate and wire, and a wider range of alloys. On more and more products, inventories of Boston warehouses are coming into balance.

In the New York area, warehouses are taking in an increasing volume of steel.

INVENTORY-CONSCIOUS—At St. Louis, warehouse inventories, now estimated at 60 per cent of capacity tonnagewise, are the best rounded since World War II. Deliveries from mills are improving, while demand at warehouses is softening. Warehousemen and consumers are watching inventories.

In the San Francisco area, warehouse stocks, although far below normal, are in better balance than they were.

In Seattle, warehouse competition is increasingly keen. Although inventories are unbalanced they are building up.

SHUTS SHOP—Reflecting the improved position of warehouses, the National Production Authority's warehouse section closed.

As warehouses' needs of steel become filled, the pressure on mills will lessen and steel for other buyers will be more readily available.

Among the things to watch is a slackening of demand in the Boston area for large diameter bars. They have been in exceptionally tight supply, largely because of the shell program.

STEADY—While demand for structural steel still exceeds supply, the Pittsburgh area is experiencing no appreciable increase in tonnage inquiries for that product. In the Boston area, structural fabricating shops are increasingly successful in obtaining fill-in sizes of structurals from premium price mills, warehouses or importers.

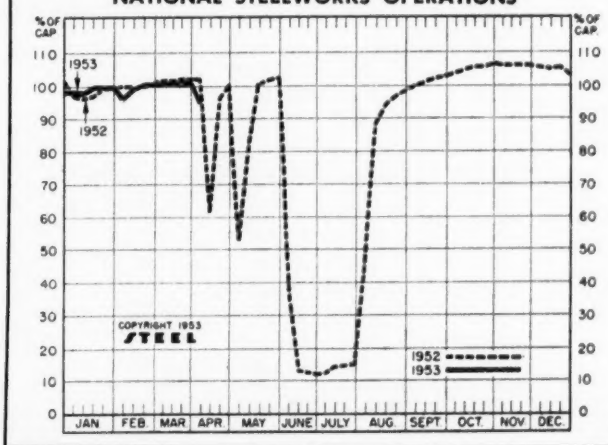
For some time, tin plate has been in adequate supply, and can makers don't think they'll need much more of this product than they have been taking. Giving tin plate strong competition as a canmaking material are glass and plastic materials.

BIG PUSH—In contrast to the instances of market softening is the continued heavy push from the automobile industry for steel. Also exerting substantial pressure are the appliance and farm equipment industries. As a result, demand for the light forms of steel, particularly cold-rolled carbon sheets, exceeds the big supply rolling off mills. Everyone's watching the automobile industry for a clue as to how long there'll be a heavy demand for steel. The auto industry is the master key to this secret.

INTERRUPTION—Delaying the day when steel supply will be in complete balance with demand, an interruption in steel production in the Pittsburgh area occurred last week. As a result, the national rate of production of steel for ingots and castings in the week ended Apr. 4 dropped from the preceding week's 101 per cent of capacity to 95 per cent, lowest level since the week ended Aug. 16 when the industry was recuperating from a strike.

The two-fisted blow in the Pittsburgh area was the shutdown of an open-hearth shop at U. S. Steel Corp.'s Homestead Works for inspection, and a strike on a railroad serving U. S. Steel plants. The open-hearth shop was closed Mar. 28 and will remain inoperative until the plant is determined safe to operate or repaired so it is safe.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Apr. 4	Change	Same Week 1952	Same Week 1951
Pittsburgh	76.5	—30*	103	101.5
Chicago	104.5†	— 1.5*	104	106.5
Mid-Atlantic	97	0	99	100.5
Youngstown	106	0	103	104
Wheeling	100.5†	0	100	96
Cleveland	99†	— 4	99	98.5
Buffalo	106.5	0	104	104
Birmingham	99	+ .5	102	100
New England	92†	+ 7	75	87
Cincinnati	97†	— 1	94	106
St. Louis	81	— 1	86.5	90.5
Detroit	107	— 2	107.5	103.5
Western	112	+ 3*	105	106
Estimated national rate	95	— 6	102	103

*Change from preceding week's revised rate.
†Estimated rates are based on Jan. 1, 1953 capacities; others on Jan. 1, 1952 capacities.
Weekly steelmaking capacity is estimated at 2,254,459 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

The Metalworking Outlook—p. 51 Production-Engineering News—p. 101

Composite Market Averages

FINISHED STEEL PRICE INDEX: Bureau of Labor Statistics	Mar. 31 1953	Mar. 24 1953	Month Ago	March Average
1947-1949=100)	130.7	130.7	130.6	130.7

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Mar. 31, 1953

Units are 100 lb except where otherwise noted below in parentheses. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952.

Rails	$3.775	Sheets, C.R. carbon	$5.275
Track spikes	6.650	Sheets, galv.	6.765
Track bolts	9.955	Strip, C.R., carbon	5.100
Tie plates	4.775	Strip, C.R. stainless (lb)	0.333
Joint bars	4.925	Pipe, black, buttweld (100 ft).	7.090
Plates, carbon	4.150	Pipe, galv., buttweld (100 ft).	8.778
Structural shapes	4.200	Boiler tubes (100 ft)	31.663
Bars, tool steel (lb)	1.576	Tin plate (100 lb base box)	8.950
Bars, 3120 alloy	6.685	Terne plate (100 lb base box).	7.750
Bars, stainless (lb)	0.153	Wire, carbon, merchant	6.075
Bars, carbon	4.100	Wire, fence, galv.	6.425
Bars, reinforcing	4.050	Nails (100 lb kegs)	7.410
Bars, C.F. carbon	5.925	Wire, barbed (80 rod spool).	5.880
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod roll)	13.629

FINISHED PRICE INDEX, Weighted:

Calculated by STEEL*	Apr. 2 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	181.31	181.31	181.31	171.92	135.91
Index in cents per lb.	4.912	4.912	4.912	4.657	3.682

ARITHMETICAL PRICE COMPOSITES:

Calculated by STEEL*					
Finished Steel NT	$110.98	$110.98	$110.98	$106.32	$81.14
No. 2 Fdry, Pig Iron, GT	55.04	55.04	55.04	52.54	39.65
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	39.18
Malleable Pig Iron, GT	55.77	55.77	55.77	53.27	40.26
Steelmaking Scrap, GT	43.75	44.17	45.00	43.00	40.42

* For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Apr. 2 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R., del Philadelphia	4.502	4.502	4.502	4.223	3.356
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.65	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del., Philadelphia	4.13	4.13	4.13	3.918	2.968
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.45
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.65
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60-75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.71
Sheets, Galv., Pittsburgh	5.075	5.075	5.075	4.80	3.95
Strip, H.R., Pitts.	3.975-4.225	3.975-4.225	3.975-4.225	3.75-4.00	3.05
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.80
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.85-5.35	3.80
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.65
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.71
Wire, Basic, Pitts.	5.475-5.225	5.475-5.225	5.475-5.225	4.85-5.10	3.775
Nails, Wire, Pittsburgh	6.35	6.35	6.35	5.90-6.20	5.20
Tin plate, box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$6.70
SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.50	$70.50	$70.50	$66.00	$54.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$", Pitts.	4.425	4.425	4.425	4.10-30	3.175
PIG IRON, Gross Ton					
Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$40.996
Basic, Valley	54.50	54.50	54.50	52.00	39.00
Basic, del. Phila.	59.25	59.25	59.25	56.61	42.004
No. 2 Fdry, Pitts.	55.00	55.00	55.00	52.50	40.496
No. 2 Fdry, Chicago	55.00	55.00	55.00	52.50	39.00
No. 2 Fdry, Valley	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry, del. Phila.	59.75	59.75	59.75	57.11	42.504
No. 2 Fdry, Birm.	51.38	51.38	51.38	48.88	37.88
No. 2 Fdry (Birm.) del. Cin.	58.93	58.93	58.93	55.49	42.23
Malleable, Valley	55.00	55.00	55.00	52.50	39.50
Malleable, Chicago	55.00	55.00	55.00	52.50	39.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	55.00
Ferromanganese, Etna, Pa.	228.00	228.00	228.00	188.00	151.00*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts.	$44.00	$44.00	$44.00	$44.00	$40.25
No. 1 Heavy Melt, E. Pa.	44.50	46.00	48.50	42.50	39.00
No. 1 Heavy Melt, Chicago	42.75	42.50	42.50	42.50	39.00
No. 1 Heavy Melt, Valley	44.25	44.25	45.25	44.00	40.25
No. Heavy Melt, Cleve.	44.25	44.25	44.25	43.00	39.75
No. 1 Heavy Melt, Buffalo	47.00	47.00	42.75	43.00	43.00
Rails, Rerolling, Chicago	56.00	56.00	52.50	52.50	49.50
No. 1 Cast, Chicago	44.00	44.00	43.00	49.00†	66.00

† F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$12.50
Beehive, Fdry, Connlsvl.	17.00	17.00	17.00	17.50	14.875
Oven Fdry, Chicago	24.50	24.50	24.50	23.00	19.25

PIG IRON

F.o.b. furnace prices as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies on pages 184-185.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.	....	60.78	61.28	....
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
AlabamaCity, Ala. R2	50.88	51.38	....	....
Birmingham R2	50.88	51.38	....	....
Birmingham S9	....	51.38	....	....
Woodward, Ala. W15	50.88	51.38	....	....
Cincinnati, del.	....	58.93	....	....
Buffalo District				
Buffalo R2	54.50	55.00	55.50	....
Buffalo H1	54.50	55.00	55.50	....
Tonawanda, N.Y. W12	54.50	55.00	55.50	....
No. Tonawanda, N.Y. T9	....	55.00	55.50	....
Boston, del.	65.15	65.65	66.15	....
Rochester, N.Y., del.	57.52	58.02	58.52	....
Syracuse, N.Y., del.	58.62	59.12	59.62	....
Chicago District				
Chicago I-3	54.50	55.00	55.00	55.50
Gary, Ind. U5	54.50	....	55.00	....
IndianaHarbor, Ind. I-2	54.50	....	55.00	....
So. Chicago, Ill. W14	54.50	55.00	55.00	....
So. Chicago, Ill. Y1	54.50	55.00	55.00	....
So. Chicago, Ill. U5	54.50	....	55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon, Mich., del.	....	61.30	61.30	....
Cleveland District				
Cleveland A7	54.50	55.00	55.00	55.50
Cleveland R2	54.50	55.00	55.00	....
Akron, O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain, O. N3	54.50	....	....	55.50
Duluth I-3	....	....	55.00	....
Erie, Pa. I-3	54.50	55.00	55.00	55.50
Everett, Mass. E1	....	59.50	60.00	....
Fontana, Calif. K1	60.50	61.00	....	....
GraniteCity, Ill. G4	56.40	56.90	57.40	....
St. Louis, del. (inc. tax)	57.15	57.65	58.15	....
Ironton, Utah C11	54.50	55.00	....	....
Geneva, Utah C11	54.50	55.00	....	....
LoneStar, Tex. L6	50.50	*51.00	51.00	....
Minnequa, Colo. C10	56.50	57.50	57.50	....
Rockwood, Tenn. T3	....	....	58.50	....
Pittsburgh District				
NevilleIsland, Pa. P6	....	55.00	55.00	55.50
Pitts., N.&S. sides, Ambridge				
Aliquippa, del.	....	56.37	56.37	56.87
McKeesRocks, del.	....	56.04	56.04	56.54
Lawrenceville, Homestead,				
Wilmerding, Monaca, del.	....	56.66	56.66	57.16
Verona, Trafford, del.	....	57.19	57.19	57.69
Brackenridge, del.	....	57.45	57.45	57.95
Bessemer, Pa. U5	54.50	....	55.00	55.50
Clairton, Rankin, So. Duquesne, Pa. U5	54.50	....	....	....
McKeesport, Pa. N3	54.50	....	....	55.50
Monessen, Pa. P7	56.50	....	....	....
Sharpsville, Pa. S6	....	....	55.00	55.50
Steelton, Pa. B2	56.50	57.00	57.50	58.00
Swedeland, Pa. A3	58.50	59.00	59.50	60.00
Toledo, O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47	....	....
Troy, N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard, O. Y1	54.50	55.00	55.00	....
Youngstown Y1	54.50	55.00	55.00	....
Youngstown U5	54.50	....	....	55.50
Mansfield, O., del.	59.15	59.65	59.65	60.15

*Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.
Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$65.50
Buffalo H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls, N.Y. P15	$91.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Los phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$59.50
Steelton, Pa. B2	62.50
Philadelphia, delivered	66.05
Troy, N.Y. R2	62.50

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NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 30.00c-34.50c, Conn. Valley; Lake 33.25c, delivered; Foreign electrolytic, del. 33.00c-36.50c.

Brass Ingots: 85-5-5-5 (No. 115) 29.50c; 88-10-2 (No. 215) 41.75c; 80-10-10 (No. 305) 35.00c; No. 1 yellow (No. 405) 24.00c.

Zinc: Prime western 11.00c; brass special 11.25c, intermediate 11.50c; East St. Louis; high grade 12.35c, and special high grade 12.50c delivered.

Lead: Common 13.30c; chemical 13.40c; corroding, 13.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 20.50c, pigs 19.50c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 24.00-24.50; No. 12 foundry alloy (No. 2 grade) 23.00-24.00; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 24.00-25.50; grade 2, 23.00-24.00; grade 3, 22.50-23.50; grade 4, 22.00-23.00.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 27.00c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 118.50c-121.50c nom.

Antimony: American 99-99.8% and over but not meeting specifications below 34.50c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 35.00c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 60.00c; 25-lb pigs, 62.65c; "XX" nickel shot, 63.65c; "F" nickel shot or ingots, for addition to cast iron, 60.00c. Prices include import duty.

Mercury: Open market, spot, New York, $199-$203, per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $37.72 per lb of contained beryllium, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2 del; special or patented shapes $2.15.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 85.25c per oz.

Platinum: $90-$93 per ounce from refineries.
Palladium: $23-$24 per troy ounce.
Iridium: $175-$185 per troy ounce.
Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Cents per pound, f.o.b. mill, effective Apr. 1, 1953. Listings are lowest quotations.)

Sheet: Copper 50.48; yellow brass 42.87; commercial bronze, 95% 49.89; 90% 48.76; red brass, 85% 47.11; 80% 45.99; best quality, 44.43; nickel silver, 18%, 59.84; phosphor-bronze grade A, 5%, 70.49.

Rod: Copper, hot-rolled 46.83; cold-drawn 48.08; yellow brass free cutting, 36.68; commercial bronze 95% 49.58; 90% 48.45; red brass 85%, 46.30; 80%, 45.68.

Seamless Tubing: Copper 50.42; yellow brass 45.78; commercial bronze, 90%, 51.32; red brass, 85%, 49.92.

Wire: Yellow brass 43.16; commercial bronze, 95%, 50.18; 90%, 49.05; red brass, 85%, 47.40; 80%, 46.28; best quality brass, 44.72.

(Base prices, effective Apr. 1, 1953)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 37.46; 30,000 lb lots, 37.58; l.c.l. 38.08, Weatherproof, 100,000 lb, 37.85; 30,000 lb, 38.10; l.c.l., 38.60. Magnet wire del., 15,000 lb or more 43.93; l.c.l., 44.68.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders, Effective Jan. 22, 1953.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	32.9	...	...
0.135-0.096	12-48	33.4	...	...
0.095-0.077	12-48	34.1	31.8	36.3
0.076-0.061	12-48	34.7	32.0	36.5
0.060-0.048	12-48	35.0	32.2	36.8
0.047-0.038	12-48	35.5	32.6	37.1
0.037-0.030	12-48	35.9	33.0	37.8
0.029-0.024	12-48	36.5	33.3	38.3
0.023-0.019	12-36	37.1	34.0	39.0
0.018-0.017	12-36	37.9	34.6	39.9
0.016-0.015	12-36	38.8	35.4	41.1
0.014	12-24	39.8	36.4	42.4
0.013-0.012	12-24	40.9	37.1	43.4
0.011	12-24	41.9	38.3	45.0
0.010-0.0095	12-24	43.1	39.4	46.6
0.009-0.0085	12-24	44.3	40.7	48.5
0.008-0.0075	12-24	45.8	41.9	50.3
0.007	12-18	47.3	43.4	52.6
0.006	12-18	48.9	44.8	57.6

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— 178-T4	Hexagonal 178-T4
0.125	56.8	...
0.156-0.188	48.0	...
0.219-0.313	45.3	...
0.375	43.7	52.4
0.406	43.7	...
0.438	43.7	52.4
0.469	43.7	...
0.500	43.7	52.4
0.531	43.7	...
0.563	43.7	49.2
0.594	43.7	...
0.625	43.7	49.2
0.688	43.7	49.2
0.750-1.000	42.6	46.4
1.063	42.6	44.8
1.125-1.500	41.0	44.8
1.563	40.5	...
1.625	39.8	43.2
1.688-2.000	39.8	...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $18.00 per cwt; add 50c cwt 100 sq ft to 140 sq ft. Pipe: Full coils $18.00 per cwt. Traps and bends: List prices plus 43%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 20.75-21.75c; over 12-in., 20.75-21.75c.

"A" NICKEL

(Base prices f.o.b. mill, effective Mar. 9, 1953) Sheets, cold-rolled 86.50c. Strip, cold-rolled 92.50c. Rods and shapes, 82.50c. Plates, 84.50c. Seamless tubes 115.50c.

MONEL

(Base prices f.o.b. mill, efective Mar. 9, 1953) Sheets, cold-rolled 67.50c. Strip, cold-rolled 70.50c. Rods and shapes, 65.50c. Plates 66.50c. Seamless tubes, 100.50c. Shot and blocks, 57.00c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb 58.00c-65.00c; 25 to 99 lb, 48.00c-55.00c; 100 lb to 5000 lb, 44.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 42.18c; oval 41.68c.

Nickel Anodes: Rolled oval, carbonized, carloads, 78.00c; 10,000 to 30,000 lb 79.00c; 3000 to 10,000 lb 80.00c; 500 to 3000 lb 81.00c; 100 to 500 lb, 83.00c; under 100 lb, 86.00c; f.o.b. Cleveland.

Nickel Chloride: 37.35c in 100 lb bags, 1 to 2 bags; 3 to 99 bags 35.35c; 34.85c over 10,000 lb, f.o.b. Cleveland, freight allowed on 300 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers $1.10 per lb; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.8c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, $1.25; 100 lb kegs $1.26, f.o.b. Carteret, N. J., freight allowed on 100 lb or more.

Scrap Metals

Brass Mill Allowances

(Prices in cents per pound for less than 20,000 pounds, f.o.b. shipping point; on lots over 20,000 pounds at one time, of any or all kinds of scrap, add 1 cent per pound. Prices effective Apr. 1, 1953)

	Clean Heavy	Rod Ends	Clean Turnings
Copper	28.625	28.625	27.875
Yellow Brass	21.375	21.125	19.625
Commercial Bronze			
95%	27.250	27.000	26.500
90%	26.125	25.875	25.375
Red Brass			
85%	25.125	24.875	24.375
80%	24.125	23.875	23.375
Best Quality(71-80%)	22.500	22.250	21.750
Muntz metal	20.000	19.750	19.250
Nickel silver, 10%	25.250	25.000	12.625
Phos. Bronze, A	30.625	30.375	29.375
Naval Brass	20.000	19.750	19.250
Manganese Bronze	20.000	19.750	19.250

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 26.50c; No. 2 copper 25.00-25.50c; light copper 23.50c; refinery brass (60% copper) per dry copper content 25.00.

INGOT MAKERS' COPPER AND BRASS SCRAP BUYING PRICES

(Carlots, delivered)

No. 1 copper, nom. 27.00c; No. 2 copper, nom. 25.00c; light copper, nom. 23.50c; No. 1 composition borings, 22.00c; No. 1 composition solids, 22.50c; radiators, 17.00c; heavy yellow brass solids, 16.50-17.00c; yellow brass turnings, 16.00-16.50c.

SMELTERS' BUYING PRICES FOR SCRAP ALUMINUM

(Carlots, delivered)

2S aluminum clippings, 17.00-17.50c; mixed clippings, 15.50-16.00c; old aluminum sheet, 14.50-15.00c; old aluminum cast, 14.50-15.00c; borings and turnings, 14.50-15.00c.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 24.00-24.50; No. 2 22.00-22.50; light copper 20.50-21.00; No. 1 composition red brass 20.00; No. 1 composition turnings 19.00; mixed brass turnings 13.50; new brass clippings 19.50; No. 1 brass rod turnings 18.50; light brass 12.50; heavy yellow brass 14.50; new brass rod ends 18.25; auto radiators, unsweated 15.00; cocks and faucets 17.50; brass pipe 18.00.

Aluminum: Clippings 2S 13.00; old sheets 10.00; crankcase 10.00; borings and turnings 8.00; pistons and struts 6.50.

Tin: No. 1 pewter 70.00; block tin pipe 100.00; No. 1 babbitt 60.00.

Lead: Heavy 10.25-10.75; battery plates 5.25-5.50; linotype and stereotype 12.00-12.50; electrotype 10.25-10.50; mixed babbitt 13.75-14.00.

Zinc: Old zinc, 5.00; new die cast scrap, 5.00; old die cast scrap, 4.00.

Nickel: Sheets and clips 58.00-60.00; rolled anodes 58.00-60.00; turnings 58.00-60.00; rod ends 58.00-60.00.

Monel: Clippings 33.00; old sheet 30.00; turnings 25.00; rods 33.00.

DAILY PRICE RECORD

1953	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Apr. 1-2	30.00-34.50	13.30	11.00	118.50-121.50	20.50	34.50	60.00	85.25
Mar. 25-31	27.50-34.50	13.30	11.00	121.50	20.50	34.50	60.00	85.25
Mar. 12-24	27.50-34.00	13.30	11.00	121.50	20.50	34.50	60.00	85.25
Mar. 9-11	27.50-33.00	13.30	11.00	121.50	20.50	34.50	60.00	85.25
Mar. 2-6	27.50-32.00	13.30	11.00	121.50	20.50	34.50	60.00	85.25
Feb. 25-28	27.50-28.50	13.30	11.25	121.50	20.50	34.50	60.00	85.25
Feb. 3-24	24.50	13.30	11.50	121.50	20.50	34.50	60.00	85.25
Feb. 2	24.50	13.30	12.00	121.50	20.50	34.50	60.00	85.25
Jan. 27-31	24.50	13.80	12.00	121.50	20.50	34.50	60.00	85.25
Jan. 22-26	24.50	13.80	12.50	121.50	20.50	34.50	60.00	85.25
Jan. 16-21	24.50	13.80	12.50	121.50	20.00	34.50	60.00	85.25
Jan. 15	24.50	13.80	12.50	121.50	20.00	34.50	60.00	84.75
Jan. 14	24.50	13.80	12.50	121.50	20.00	34.50	60.80	84.25
Jan. 13	24.50	13.80	13.00	121.50	20.00	34.50	56.50	83.75
Jan. 12	24.50	13.80	13.00	121.50	20.00	34.50	56.50	83.25
Mar. 1953 Avg.	30.51	13.30	11.00	121.50	20.50	34.50	60.00	85.25
Feb. 1953 Avg.	25.136	13.30	11.431	121.50	20.50	34.50	60.00	85.25
Mar. 1952 Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9% base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

The Metal Market

30-cent mark is where top U. S. companies think copper price will settle when a one-price level returns. It may take some time, however, to get foreign prices that low

THIRTY CENTS is the magic word in copper today. That's the place top U. S. companies are betting copper will settle when a one-price level emerges.

If a world copper price is established at 30 cents, it will end the multiple pricing setup that arose when the State Department and defense agencies agreed to let Chile charge 3 cents a pound more than domestic companies. It will also mean that fabricators won't be as bad off as they reckoned when controls went off and prices skyrocketed. Before decontrol, users were paying 29.30 cents a pound for their mixture of domestic metal at 24.50 and foreign at 36.50. At 30 cents, and it will take some time to bring foreign prices that low, buyers won't be thinking of Ft. Knox when they place orders.

Join the Party—Phelps Dodge was the first to price its domestic output at 30 cents. A week later, in rapid-fire succession, Anaconda snipped its tags by 2 cents and Kennecott, realizing the futility of attempting to maintain a conservative 27.50, tacked another 2.5 cents on its quotations.

With the big three in accord pricewise, about three-fourths of U. S. mine output is at the one level. Customer smelters would like to join the party too, but say they can't get scrap dealers to co-operate with their prices, and those of other domestic primary producers are currently in the 33 to 34.50-cent range. Pressure has been put on scrap dealers to bring prices down, but to no avail. Custom smelters posted lower buying prices, dropped prices of top scrap grades in a start toward cutting price of their products. Ingot makers' buying prices are now nominal, but brass mills set a one-price level above former low quotations.

Bargain Counter — The present trend means Chile and other high-priced foreign suppliers will feel a pinch. Added to the crowd of foreign suppliers descending on the American market like women on a bargain counter are South Africa, Sweden and Australia.

They're shading the Chilean quotations now; at the end of April, Chile will find unsold metal on its hands. Alternatives will be to let metal pile up or to get prices in line. Both prospects are distasteful because they mean a loss of coin to a government supported primarily by copper revenues.

Brass Spread Narrows—One reason behind the adjustments in primary copper is an attempt to get brass and wire mill prices more competitive. American Brass Co. and Anaconda Wire & Cable Co., which take Anaconda's entire domestic output, now are closer to the rest of the industry pricewise.

The wire company reduced prices 1.70 cents on bare and magnet wire, 1.27 cents on weatherproof. Kennecott's Chase Brass Co. and Kennecott Wire & Cable Co. moved their quotations up from a base of 32.10 cents to 32.60 cents for copper and down from 12.58 to 12.08 for zinc.

Tin Price Shaky

Tin price is about to take the long-awaited tumble, if present trends are any indication. Today you can get tin from dealers up to 3 cents under RFC price; futures are down several cents and headed lower as Singapore and London markets have broken sharply in the past week. Unwritten verification that another surplus will pile up this year came when the International Tin Study Group omitted its usual estimate of world tin consumption and production. RFC today is in the position of supporting the world price, rather than holding a ceiling.

STEEL'S Metal Price Averages for March, 1953
(Cents per pound)

Electrolytic Copper, del. Conn.	30.51
Lead, St. Louis	13.30
Prime Western Zinc, E. St. Louis	11.00
Straits Tin, New York	121.50
Primary Aluminum Ingots, del.	20.50
Antimony, f.o.b. Laredo, Tex.	34.50
Nickel, f.o.b. refinery	60.00
Silver, New York	85.25

High Spots from Metal Companies' Annual Reports

Company (Including Subsidiary)		Sales	Federal Income Taxes	Net Income (After Taxes)	Earnings per Share of Common Stock
Alcoa	'52	$577,753,399	$48,600,000	$43,527,142	$8.38
	'51	534,514,905	76,500,000	39,301,308	7.53
Reynolds	'52	234,738,789	19,726,149	14,731,071	8.71
	'51	215,704,848	32,288,822	15,837,846	9.33
Kennecott	'52	471,551,697	73,580,488	86,150,718	7.96
	'51	451,192,197	83,035,765	91,347,153	8.44
Phelps-Dodge	'52	262,915,557	29,300,000	35,026,550	3.45
	'51	258,162,394	43,800,000	42,077,434	4.24
Calumet & Hecla	'52	50,816,934	1,600,000	1,837,778	0.89
	'51	44,578,149	2,520,000	2,450,565	1.18
American Smelting & Refining	'52	476,208,489	26,460,948	31,635,814	5.35
	'51	530,817,779	40,274,880	39,742,313	6.89
Revere	'52	187,771,607	18,600,000	6,790,913	5.27
	'51	180,864,236	16,100,000	6,935,083	5.38
Bridgeport Brass	'52	126,766,676	8,300,000	4,023,523	4.23
	'51	101,710,809	6,845,000	3,860,998	4.04
Scovill Mfg.	'52	94,282,286	2,101,118	2,620,068	1.73
	'51	118,484,161	10,923,255	5,566,825	4.13
Mueller Brass	'52	51,383,284	5,860,363	3,024,331	5.70
	'51	42,542,798	4,625,000	2,276,763	4.29
General Cable	'52	116,351,809	11,100,000	5,283,230	2.38
	'51	not available	11,800,000	5,506,949	2.48
National Lead	'52	358,048,435	25,326,109	23,060,054	2.06
	'51	389,941,313	36,613,823	22,993,717	2.05
St. Joe	'52	105,211,886	5,667,894	9,638,455	3.55
	'51	110,834,083	13,819,817	13,577,236	5.00
American Zinc, Lead & Smelting	'52	79,793,391	2,195,000	2,657,618	3.44
	'51	79,769,875	4,250,000	3,394,884	4.54
International Nickel	'52	314,228,747	43,598,993	58,891,282	3.90
	'51	286,785,241	48,148,718	62,875,571	4.17

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Chase mills inspect every coil of wire produced. No scratches, no slivers, spills, or laps! Chase wire is of uniform temper and grain size, uniform in surface texture and color, accurate in gauge. It comes to you clean and bright.

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CANCER STRIKES 1 IN 5

STRIKE BACK—GIVE TO CONQUER CANCER!

Demand Pressure for Sheets Undiminished

Little open-end tonnage seen in second quarter with makers entering period with substantial order carryovers. Strong demand into fourth quarter generally expected

Sheet and Strip Prices, Page 185 & 188

Cleveland — Sheetmakers continue under pressure from the automobile builders and appliance manufacturers. Both hot and cold-rolled sheets are in strong demand and carryover from first to second quarter leaves few openings in schedules for the second quarter. Shipments from some mills are reported as much as 1½ months behind schedule.

Even galvanized sheets, which in the recent past have been moving sluggishly, are showing more life, while such specialties as electrical grades and enameling stock are moving briskly.

As a general thing the sheetmakers anticipate no letup in consuming pressure until well along toward the close of the year. In hot and cold-rolled sheets the mills could now book through third quarter were they so disposed, so strong is the pressure for tonnage.

Military requirements will continue to get priority after controls are removed, and barring unforeseen easing off in the defense program, it is indicated the military tonnage will bulk large in the distribution picture for months to come.

Removal of price controls has not been followed by any move on the part of sheetmakers to increase prices. However, some advances are expected should coming wage negotiations result in further increase in labor rates.

Last week the Container Division, Jones & Laughlin Steel Corp. raised prices on some steel drums and pails effective Apr. 1. Increases vary with the different items and points of production. They reflect increased manufacturing costs, the greatest of which resulted from the 1952 steel wage settlement. According to the company's announcement, the price increase permitted by OPS on drums and pails following the wage settlement last year was only enough to compensate for the higher cost of steel.

Boston—Narrow cold-rolled strip orders for second quarter for the most part are covered with tickets although there are scattered openings for June in carbon grades. Sheets, notably cold-rolled, are in tighter supply than strip, and, on the whole, open-end tonnage is far less than had been expected, including wide coils for slitting. Stamping shops, with limited inventory for automobile parts, are being forced to dip into their reserves to meet deliveries. Hot-rolled carbon grades in the heavier gages, Nos. 10 and 12, are sold out through second quarter with some tickets unplaced. Straight chromium stainless is being booked for July shipment.

Cincinnati — Consumer pressure for sheets is strong. One mill is sold out through third quarter and expects strong demand through 1953. Orders indicate that there is no inventory building of any consequence. Automotive, appliance and farm equipment manufacturers are providing the bulk of demand which is believed to be as great as it has ever been.

Philadelphia — Except for galvanized, all major grades of sheets are in tight supply, and even galvanized sheets are not particularly easy to obtain at mill level. Producers of hot and cold-rolled sheets declare third quarter allotments will be no heavier than during the current quarter. This also will be true with regard to electrical sheets, enameling stock and certain other specialties. Continuation of full government control over nickel bearing steels will strengthen demand for straight chromium material over coming months.

St. Louis—Sheet mills report more interest in conversion steel, especially from the automobile and appliance industries. Inquiries are up sharply and mills are booked through the third quarter on conversion stock. Third quarter books on finished steel will open probably next week. Granite City Steel Co. will book only a part of the period's capacity. Its sheet output will cease after four to six weeks following Apr. 10 for installation of new rolling and finishing equipment.

Youngstown—Steel business here is holding up well and mill executives are putting back further into the future the date when they expect supply to catch up with demand. The automobile industry is making big demands on the local mills for more steel. Motor executives are continually flying here to confer on additional tonnage. Indications are increasing that there won't be any immediate price increases on most steel products. Some may come this summer, however, following wage settlements with the union.

New York—While some consumers of hot and cold-rolled sheets have been warned to look elsewhere for tonnage in the third quarter, there will not be too much of this for a while. Some large producers say that, despite the lifting of most government controls by that time, there should be little variation in their customers for some time to come. They do not expect to drop many who have been on their books. Nor do they expect to accommodate many, if any, who haven't been—at least with the market as active as it

(*Turn to page* 172)

Warehouse business expected to double as . . .

Crucible Opens New Unit at Los Angeles

MODERNIZATION and expansion of its warehouse distribution system is paying off for Crucible Steel Co. of America, New York. "Every time a branch warehouse has been improved, the business has doubled," says W. H. Colvin Jr., president.

Mr. Colvin expects the same thing to happen in Los Angeles where Crucible opened a new warehouse at 3338 Malt Ave. in the Central Manufacturing District. It has 12,000 square feet of warehouse space, 3200 feet of office space. P. F. Harris is district manager.

Millions for Improvement — Since 1946, Mr. Colvin says, his company has spent $2,275,000 on its warehouse program. For over-all plant expansion and rehabilitation, Crucible is laying out $105 million, of which $7.25 million remains to be spent.

Crucible also has new warehouses at Chicago, Philadelphia, Detroit and Indianapolis. Coming up are modernized warehouses at Milwaukee and Buffalo scheduled for completion in 1953. New Haven will be added to the schedule later.

Builds, Sells, Leases—As new warehouses are completed, Crucible sells them to investors and then rents them back on long-term leases. Crucible also maintains three mill warehouses at Syracuse, Harrison, N. J. and Pittsburgh. These carry pool stocks which each of the 26 branch warehouses can draw on for fast replenishment. Mr. Colvin remarked that total stocks now are up to $46 million from $29 million in 1929.

Business Outlook—Mr. Colvin thinks steelmaking operations will go below 100 per cent of capacity in third quarter of this year and will be still lower in fourth quarter. This slowdown, he feels, will be healthy for the nation as it has been operating under forced draft since June, 1950. "Business will still be good," he said.

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, San Francisco, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††‡		Carbon	Floor
Baltimore	5.81	7.17	8.32	6.42	...	6.41	7.18	11.17	6.47	6.47	7.70
Boston	6.51	7.35	8.39	6.55	...	6.42	7.49	12.37	6.56	6.80	7.98
Buffalo	5.80	6.65	8.31	6.21	...	5.90	6.95	11.07	6.08	6.30	7.67
Birmingham	5.80	6.65	7.70§	5.80	...	5.80	7.85	...	5.95	6.10	8.15
Chicago	5.80	6.65	7.90	5.83	...	5.83	6.80	10.65	5.95	6.00	7.18
Cincinnati	6.13	6.72	8.21	6.14	...	6.13	7.16	10.97	6.42	6.47	7.60
Cleveland	5.80	6.65	8.04	6.00	...	5.89	6.90	10.79	6.28	6.17	7.51
Detroit	6.23	6.46	8.44	6.08	7.495	6.12	7.10	10.92	6.42	6.47	7.52
Houston	6.74	...	8.67	6.89	...	6.98	...	...	6.82	6.78	8.16
JerseyCity,N.J.	6.26	7.27	8.32	6.56	...	6.59	7.53	9.54	6.39	6.60	8.01
Los Angeles	6.60	8.45	9.50	6.75	11.20	6.60	8.65	12.05	6.60	6.70	8.90
Milwaukee	5.97	6.82	8.07	6.00	...	6.00	7.07	10.82	6.12	6.17	7.35
Moline, Ill.	6.16	7.00	8.30	6.19	...	6.18	6.91	...	6.30	6.30	...
New York	6.26	7.37	8.32	6.56	...	6.69	7.63	11.14	6.49	6.70	8.11
Norfolk, Va.	7.60	...	...	...	...	6.44	8.70	...	7.25	6.84	7.33
Philadelphia	6.16	7.18	7.70	6.50	8.30	6.47	7.50	10.89	6.22	6.29	7.42
Pittsburgh	5.80	6.65	7.90	5.97	...	5.83	6.90	10.65	5.95	6.00	7.18
Portland, Oreg.	7.80	9.05	9.75	7.60	...	7.35	9.40	...	7.30	7.30	9.25
Richmond, Va.	6.14	6.95	8.68	6.53	...	6.30	7.63	...	6.58	6.68	7.80
St. Louis	6.10	6.94	8.20	6.14	...	6.13	7.20	10.95	6.35	6.35	7.58
St. Paul	6.47	7.31	8.61	6.50	...	6.49	7.32	...	6.61	6.61	7.84
San Francisco	6.85	8.15	9.45	6.70	...	6.60	8.65	12.00	6.45	6.70	8.85
Seattle-Tacoma	7.36	8.24	9.40	7.40	...	7.08	9.37	12.00	6.83	7.19	9.10
Spokane (city)	7.80	9.40	10.15	7.15	...	7.10	9.70	11.90	7.00	7.10	9.15
Washington	6.31	7.61	8.90	6.89	...	6.90	8.03	...	6.93	6.95	8.17

Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes 25-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; ³—500 to 1499 lb; ⁴—1000 to 1999 lb.

Warehouse . . .

Warehouse Prices, Page 170

New York—Sheets in all gages and sizes are in short supply with warehouses, demand far exceeding supply. Larger volume of steel is being taken in by distributors, but not in sizes to balance inventories. Cold finished bars illustrate this point. Small sizes are plentiful, but over 1-inch racks are lean. A like situation prevails in plates. Structural stocks are low with no early improvement in inventory indicated. For June delivery, more alloy tonnage is offered, notably electric furnace grades.

Boston—On some products warehouses are not placing orders to the extent of allotments. Small cold-finished bars, strip light plates, wire, and a wider range of alloys are in this category. Products in tightest supply at warehouse are heavy bars and plates, cold-rolled sheets and wide-flanged beams. Warehouses are filling up on more products to the point where inventories are balanced. Butt-weld pipe is in this category. Demand for steel from warehouse continues brisk.

Philadelphia — Warehouse business in March was the best so far this year and prospects are that April trading will be equally as good. Demand is especially active for sheets, plates, shapes and bars. An exception in this respect is galvanized sheets with further weakness in prices indicated. General inventories are heavier but still unbalanced.

Cleveland — District steel distributors are meeting with increasing difficulty in getting sufficient sheet tonnage to care for their customers' pressing demands. One large warehouse reports its sheet shipments from the mills are running 2½ months behind shipment dates.

Meanwhile, consuming demand never was greater with automotive and appliance manufacturers scouring the market for tonnage.

Generally, warehouse stocks are much improved over six months ago but they are still highly unbalanced. Small bars are in increasing supply but it is difficult to obtain large sizes. The same is true with plates, light gages are in fair supply, but the heavy sizes are extremely scarce.

March order volume of the warehouses here showed improvement over that of February, and a further gain is anticipated in April with building steel requirements expanding seasonally.

Cincinnati — Distributors in this area have been doing a good volume of business. Stocks are sketchy with many sizes out of balance. The building product lines including wire mesh, reinforcing and structurals have started to pick up. Large diameter bars, sheets, and large tubing are as tight as they have been at any time.

Chicago — Because nickel-bearing stainless steel is under such stringent restrictions as regards use, warehouses find the material somewhat slow to move. Production is at a good clip and stocks over-all are comparatively good. Problem is to find a sufficient number of eligible consumers, for example, those holding tickets. This accomplished, size requirements and inventories frequently do not match.

St. Louis—Warehouse inventories, now estimated at 60 per cent of capacity tonnagewise, are the best rounded since the war. Deliveries from mills are picking up while demand softens. Heavy rounds, heavy plates and light flat cold-rolled sheets are in less than ample supply but most other items are comfortable, although spotty size-wise. Galvanized sheets are in unusually good supply. Consumers and warehousemen both are watching inventories closely.

Birmingham—Warehouses still are fretting over inability to build up inventories satisfactorily and season demand for most items is reported on the increase. A great many wanted items still are completely out of stock.

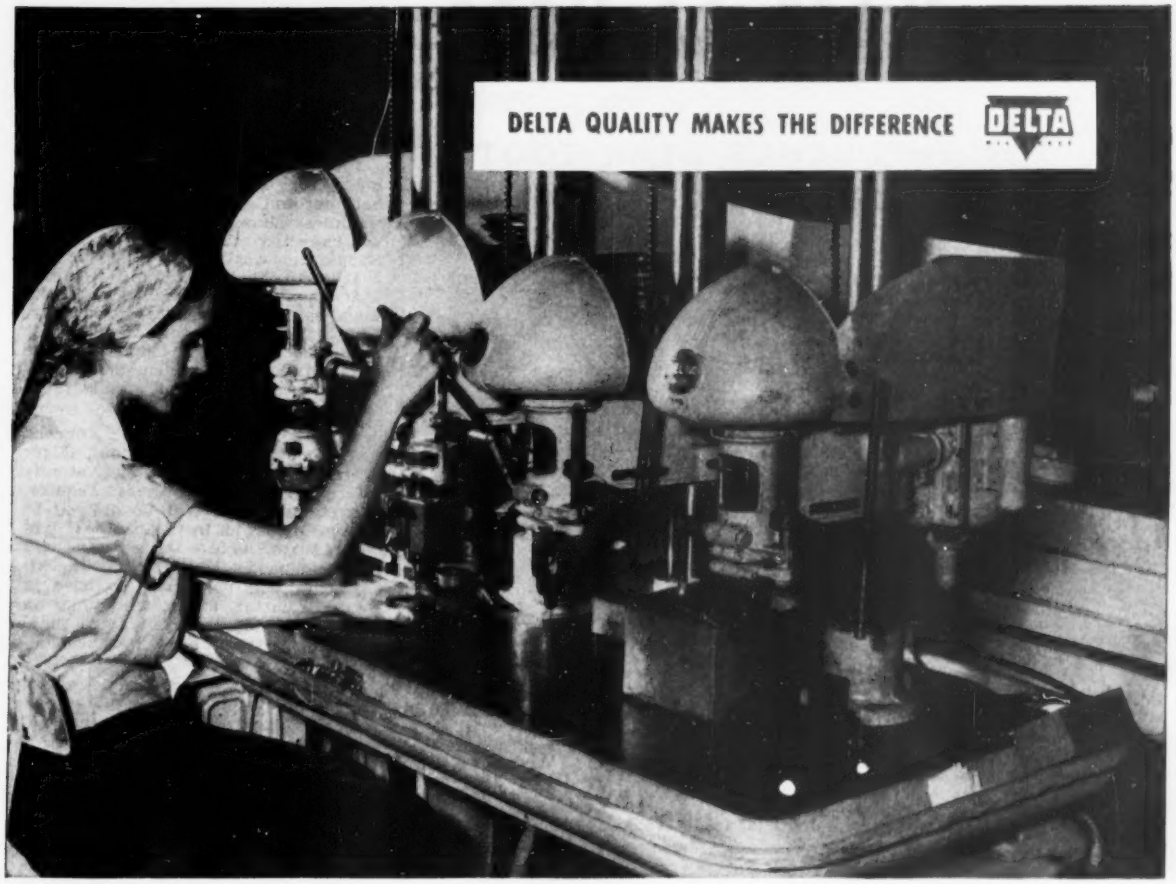
Los Angeles—Distributors' prices for hot-rolled carbon sheets advanced 5 cents to $6.90 per 100 pounds. With hot-rolled supplies tighter than ever, offerings of hot-rolled at $9.50 are being made by premium-priced "warehouses" to fabricators with good volume acceptance.

San Francisco—Distributors have not lifted prices since removal of government ceilings. As far as can be ascertained, there are no plans for a general boost. Some sellers concede, however, there may be some changes later. Mill trends are being watched closely. Meantime, stocks are in better balance, but still far from normal. Tending to unbalance the inventory are the lack of plates, hot-rolled sheets, structurals and other items.

Seattle—Warehouse executives observe that competition is keener as conditions swing into a buyers' market. Inventories are building up but continue unbalanced. Heavy plates and large rounds are the scarcest items. Cold rolled sheets are again tighter, attributed to the heavy call from auto manufacturers. Demand for all items continues strong and is expected to increase as the season advances.

Pittsburgh—The Dumas Steel Corp. is opening a new steel processing warehouse at Marietta, Ga. Operations were scheduled to start Apr. 1.

(*Turn to page* 172)



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Though Delta tools are inexpensive, they are production machine tools—as accurate as tools costing many times as much.

Here's the testimony of John Strasenburgh, Skillman production foreman: "Of course, since we build locks, our precision standards are very high, and we work as close as .0005", but our Delta tools are accurate, dependable and easy to operate."

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- . . . three Delta drill presses together to drill, tap and counter sink.
- . . . four Delta drill presses—to hollow mill, drill, tap and counter sink.
- . . . two 17" Delta drill presses mounted on single column with opposing spindles drilling and reaming same hole in one set-up.

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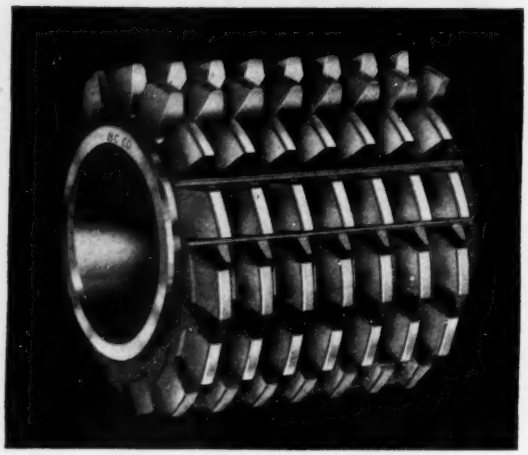

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Sheets, Strip . . .

(*Continued from page* 169)

is. It appears at the moment that third quarter allotments will run about the same as in the first and second quarters.

Pittsburgh—Demand is expected to hold strong through third quarter for both hot and cold-rolled sheets. If any weakness shows up in demand, it is not expected much before that time. Should no weakness develop before that time, it is generally assumed that supply will be balanced with demand some time during third quarter. This balance could occur at an earlier date. Much will depend upon how the automotive labor problem resolves itself, and ability of auto builders to sustain high level production.

Chicago — Sheetmakers opened their books Apr. 1 as required for third quarter military and atomic energy tonnage. For civilian requirements, producers will be obliged to assign quotas as in the past. It will be mid-April before these quotas will be announced. Hope is that the allotments will be equal to those in second quarter, but it will hinge on the amount of carryover. Third quarter does not promise lessened demand.

Birmingham — Considerable carryover is likely in sheets as things now look for third quarter. Not a great deal of open-end flat tonnage is available in the district, according to informed quarters, and probably will not be for some months.

Los Angeles—Supply situation in hot-rolled sheets is worsening. Fabricators' requirements are intense and stocks of flat-rolled are low in needed sizes. Some fabricators are well-stocked with material not in readily useable gages or widths purchased previously.

Warehouse . . .

(*Continued from page* 170)

At the start it will process and market sheet and tin mill products, including hot and cold-rolled sheets and galvanized carbon steel sheets and strip. When conditions permit the line will be expanded to include other products, such as hot and cold-rolled strip, hot-rolled bars and bar shapes, light structurals and plates. J. W. Clauser, formerly in charge of the company's Jersey City warehouse is in charge of the new operation. Facilities include a shear and a sheet slitter. The company, which operates warehouses in Pittsburgh, Chicago and Jersey City, is headed by M. G. Dumas, president.

Tubular Goods . . .

Tubular Goods Prices, Page 189

Seattle—The cast iron pipe market is beginning to develop seasonal activity. Three local improvement jobs, two near Seattle, the other at Astoria, Oreg., involve about 800 tons, sub-awards pending. Bids are in at Alderwood Manor, Wash., for an unstated tonnage of steel pipe. Federal Supply Service, Seattle, has called bids on 25,000 feet steel pipe, two schedules, bids Apr. 6 and 9 respectively.

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CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL, Apr. 2, 1953; changes shown in italic.

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $85, Palmerton, Pa.; $85, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $225 per gross ton of alloy, c.l. packed $237; gross ton lots, packed, $252; less gross ton lots, packed $269; f.o.b. Sheridan, Pa., Alloy, W. Va., Niagara Falls, N. Y., Ashtabula, Philo or Marietta, O., Lynchburg, Va. Base price: $227, Johnstown, Pa.; $228, Etna, Pa.; $226, Anaconda, Mont.

Shipment from Pacific Coast warehouses by one seller, add $33 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $267; less gross ton lots, $284, f.o.b. Chicago. Add or subtract $2.80 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 0.5c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 30c; ton lots, 32c; 250 to 1999 lb, 34c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max. Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High - Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta. deld.; less ton lots $3.80.

Silicas Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton lot 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr, 5-7%, Fe 20% approx). Contract, carload, packed, ⅛" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%), C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c, less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Sigio, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., $1.14, in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c..

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 10.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packed 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l., packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.03% C 37.60c per lb contained Cr, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. 8 M x D, bulk, 26.25c per lb of contained Cr C.l., packed 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon, F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-39%, Al 7-9%, C 0.05% max.) 25.75c per lb of contained silicon plus 16.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract carload, 1" x D; packed, max 0.50% C grade, $1.12 per lb of contained chromium, ton lots $1.14, less ton $1.16. Delivered. Spot, add 5c; prices on 0.10 per cent carbon grade, up 4c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max), $3.20. **Primes and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c, F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

TUNGSTEN ALLOYS*

Ferrotungsten: (70-80%), 10,000 lb W or more, $4.85 per lb of contained W; 2000 lb W to 10,000 lb W, $4.95; le s than 2000 lb W, $5.07, f.o.b. Niagara Falls, N. Y.

*Government ceiling prices, effective May 7, 1951, f.o.b. Niagara Falls, N. Y., basis.

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PERFORATED
METAL
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PERFECT
SCREENS
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Steel Bars . . .

Bar Prices, Page 184

Boston—Demand for large diameter bars has slackened although supply still is tight. Smaller bars, 1-inch and under, are in better availability. Demand for alloys is only fair, especially on the part of warehouses. Armament requirements for both alloy and carbon bars, also forging stock, continues at high level and preliminary third quarter allotments point to some reductions in numerous grades. More commercial tonnage will be available in third quarter than in second, especially in small sizes.

New York—Hot carbon bar producers estimate that they will be able to give their customers little if any more tonnage in the third quarter than they have already allocated for the second quarter. It is possible that they may be able to do a bit more in small angles and flats and possibly in small rounds, but they see no increase whatsoever in what they will be able to offer in the way of larger sizes. Shell steel rounds will continue particularly tight for some months to come, it is believed. Cold-drawn carbon bar outlook continues promising, with drawers still concerned largely over their ability to obtain hot stock in sufficient variety of size to enable them to benefit to the fullest extent from anticipated inquiry. Alloy bars are in steady demand.

Philadelphia—Major bottleneck in the bar market continues in sizes 2-inches and up, reflecting pressure for shells. But even in the smaller sizes producers are sold up throughout the second quarter and doubt if they will be able to provide customers with more tonnage in the succeeding three months. Cold-drawers are accepting tonnage for next quarter and such as is being offered for fourth quarter, as well.

Pittsburgh — Steel bar producers are marking time and give no indication as to the course they will follow when books are opened for third quarter. They do expect a return to more normal volume during the period and are currently working hard to reduce any carryover they might normally take with them into third quarter. Their main goal seems to be to make delivery promises that can be kept in the absence of government directives.

Cleveland—Some bar mills are entering second quarter with substantial order carryover from the first three months. This means they will not be in position to offer much to their customers in the way of open tonnage in second quarter. Generally, small size bars appear to be increasing in availability, as has been the case for some time past, but the larger sizes are, if anything, even more difficult to obtain than they were months back. The reason for this is attributed to increased pressure from the military for shells.

Expectations are no relief in the large bar supply pinch will likely develop much before late in the year, depending, of course, on developments in the world political situation. Renewal of truce negotiations in the Korean war, it is said, will not materially affect current heavy demands

(*Turn to page* 178)

UPSON-WALTON
wire rope

Engineered for safety

In making Upson-Walton extra flexible crane rope, materials and manufacturing practices meet exacting specifications. Slings are factory assembled from Upson-Walton wire rope and Upson-Walton fittings.

Write for names of nearby distributors. Catalog on request.

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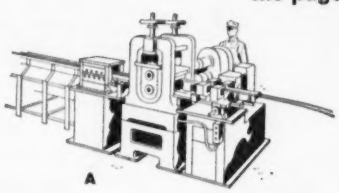
12500 ELMWOOD AVENUE • CLEVELAND 11, OHIO
New York • Chicago • Pittsburgh
Manufacturers of
WIRE ROPE • FITTINGS • TACKLE BLOCKS
Established 1871

Call Solar
FOR STEEL

— and do you recognize the most modern and efficient steel processing equipment? These production machines are operated at our various plants. Check your guesses below, then turn the page upside down for correct answers.



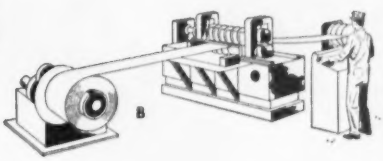
A

is this

- ☐ a Temper Mill?
- ☐ an Edge Rolling Mill?
- ☐ a Coil Slitter?

is this

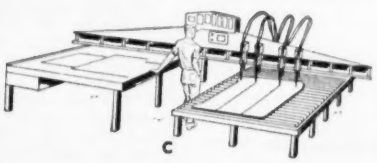
- ☐ a Shearing Machine?
- ☐ a Cold Rolling Mill?
- ☐ a Coil Slitter?



B

is this

- ☐ an Automatic Saw?
- ☐ a Flame Cutting Machine?
- ☐ an Automatic Cut-off line?



C

A - edge rolling mill B - coil slitter C - flame cutting machine

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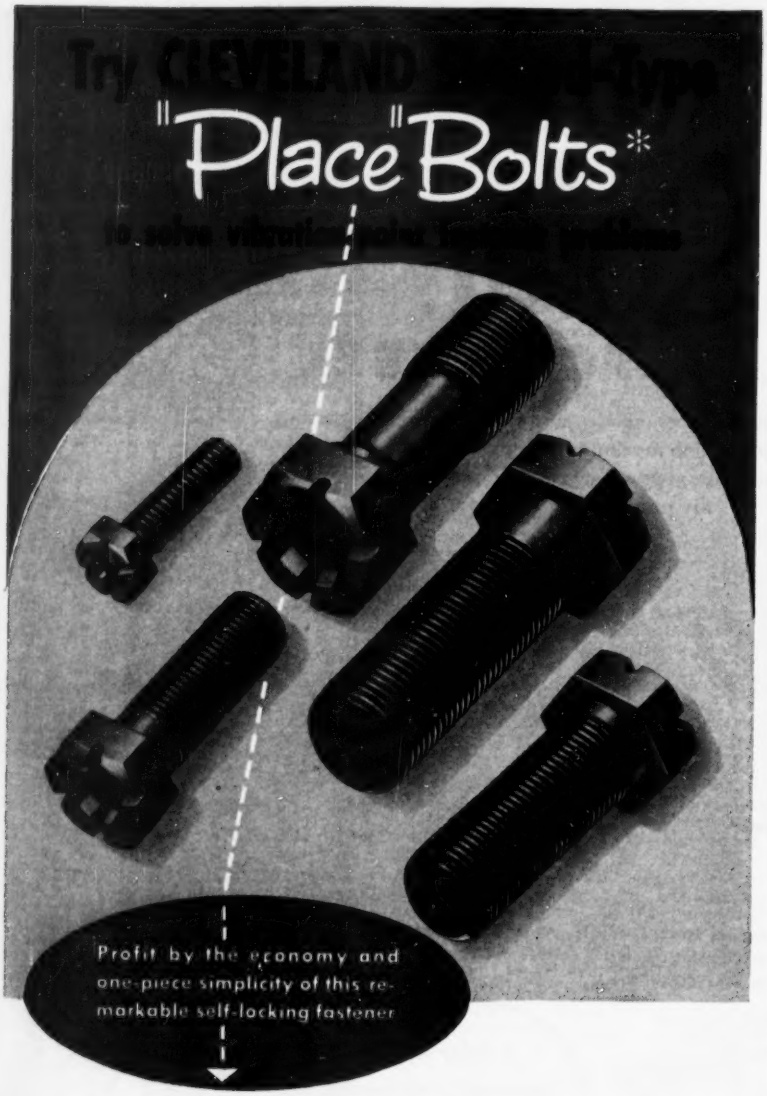


● Find out about Place Bolts *now!* New users and new uses are multiplying daily. A cold-forged fastener made of either high carbon or alloy steel, the Place Bolt head brings *elastic spring action* to bear on seating surfaces, combining with the elastic elongation of the shank to safeguard against loss of initial bolt-tension. Vibration-and-shock-proof holding power is assured. Sizes range from 1/4" diameter upwards, standard or special. Write today for our Place Bolt Folder.

*Licensed under U. S. Patent No. 2543705.

CLEVELAND *Top Quality* FASTENERS

originators of the Kaufmann DOUBLE EXTRUSION Process

(Continued from page 176)

of the military. Even should a truce be reached no letdown in the defense program is anticipated.

Cincinnati—Alloy bars have undergone a noticeable improvement in inventories and deliveries out of mills as compared with three or four months ago. An attempt is being made to move off-analysis bars. Demand has been good, particularly in the large diameter bars. Carbon bar business in March was about the same as in February. Inventories are good but sizes are broken.

Chicago — Some steelmakers are finding their position more uncomfortable in bars than in sheets with deliveries more extended and carryover proportionately greater. Reason for this is the impact of the military shell and shell case programs which require hot-topped steel and thus put a strain on production facilities. The military accommodation, therefore, is at the expense of commercial grade bars. Third quarter shell needs will be essentially the same as in second quarter but total bar carryover is considerable and civilian users will be given quotas as previously.

Wire . . .

Wire Prices, Page 188

Boston—Manufacturers of automobile accessories are usually the first to sense any change in buying by the auto builders and developments in their line, consequently, provide an indicator of the buying trend in the industry. The only sign of shipment deferment noted here is in wire wheels. One buyer has held up shipments. Demand for several other wire products is heavy and producers are under pressure for tonnage, notably upholstery wire. Cold-heading wire is well booked into June, but deliveries are improving. Weak spots in the wire trade, with open tonnage available in second quarter, include plain galvanized wire, fine carbon specialties, merchant products and music wire.

New York—Bulk of wire mill space in second quarter is taken up by ticket tonnage, although there are spots for scattered open-end volume, mostly fine wire specialties, including music wire. Upholstery spring wire is sold through second quarter, also cold heading and manufacturers wire. Heading stock deliveries are improving. Plain galvanized is slower. All grades used by the automotive industry, including valve spring wire, are under pressure. Some third quarter orders are already in for valve spring. Clock spring stock is slightly more active.

Chicago—Demand for high-carbon spring wire and welding wire continues to exceed output. For most other manufacturers wire products, however, consuming requirements are being met. Except for the two items mentioned, inventories are fairly satisfactory. Merchant wire products continue to move slowly.

Birmingham—Most wire products are reported in satisfactory supply in the territory. Demand for manufacturers' wire continues steady but some other items, notably nails, are more plentiful than for probably two years.

"I could see the corpsman kneeling over me. The blood plasma was running down through a tube into my arm and he said everything was going to be O.K. I was walking across an enemy mine field in Seoul when one exploded and a piece of shrapnel caught me in the leg.

" 'Got enough of that stuff?' I asked him, pointing to the blood. 'I guess we never have enough,' he said, 'but you can thank *somebody* for this pint.'

"How do you thank 'somebody' for blood? For saving your life? When I got back home, I discovered the answer at my local blood donor center. There's only *one* way to say thanks—by giving some of your own blood."

"How do you thank 'somebody' for Blood?"

Yes, all kinds of people give blood—for all kinds of reasons. But whatever *your* reason for giving blood, this you can be sure of: Whether your blood goes to a combat area, a local hospital, or for Civil Defense needs—this priceless, painless gift will some day save an American life!

Business Executives!
✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ☐ Have you given your employees time off to make blood donations?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed employees of your company's plan of co-operation?
- ☐ Was this information given through Plant Bulletin or House Magazine?
- ☐ Has your company given any recognition to donors?
- ☐ Have you conducted a Donor Pledge Campaign in your company?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*

Give Blood Now—Call Your Red Cross Today!

National Blood Program

ORES–COKE–REFRACTORIES

Prices as reported to STEEL, Apr. 2, 1953; changes shown in italic.

Ores

Lake Superior Iron Ore

(Prices effective for ore delivered up to and including June 30, 1953; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.10
Old range nonbessemer	9.95
Mesabi bessemer	9.85
Mesabi nonbessemer	9.70
Open-hearth lump	10.95
High phosphorus	9.70

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect on Dec. 31, 1952, and increases or decreases after such date for buyer's account.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Iron Ore

Cents per unit, c.i.f Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.21 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 90c-93c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$27.00-$28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom. $32

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89.00; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $99.30 Salina, Pa., $104.55; Niles, O., $109; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $99.30; Hays, Pa., $105.10; Niles, O., $107; E. Chicago, Ind., Joliet, Rockdale, Ill., $109.70; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $179.55; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $186.90.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $69.30; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $92.40; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $127; Johnstown, Pa., $127.30; Clearfield, Pa., $135; St. Louis, $138; Athens, Tex., $140.90.

Nozzles

Reesdale, Pa., $203.20; Johnstown, Pa., $208.40; Clearfield, Pa., $219.45; St. Louis, $224.65; Athens, Tex., $225.20.

Runners

Reesdale, Pa., $158.20; Johnstown, Pa., $161.70; Clearfield, Pa., $168.60; St. Louis, $170.30; Athens, Tex., $174.40.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St., Louis, Mexico, Mo., $166.30; Danville, Ill., $169.30.
60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $210.20; Danville, Ill., $213.20.
70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $244.85; Danville, Ill., $247.85; Clearfield, Pa., $252.

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsville fur.	$14.50-15.00
Connellsville fdry.	16.50-17.50
New River foundry	20.80
Wise county foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$24.00
Everett, Mass., ovens New England, del.	*26.05
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	25.85
Painesville, O., ovens	25.50
Cleveland, del.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	21.65
Cincinnati, del.	26.58
LoneStar, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, del.	26.00
Portsmouth, O., ovens	24.00
Cincinnati, del.	26.62
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	28.08
Flint, del.	28.23
Pontiac, del.	27.06
Saginaw, del.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	$44-45
Birmingham area	$49.50

Cents per pound, ovens

Phenol, 40 (carlots, nonreturnable drums)	17.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40.
Imported, net ton, duty paid, metallurgical grade, $30-$35.

Iron Ore . . .

Iron Ore Prices, Page 180

Cleveland—Movement of iron ore by vessel from upper lake ports has started, marking one of the earliest lake ore shipping seasons on record. In the week ended Mar. 30, 59,099 tons were moved, 31,527 tons coming from Duluth, and 27,572 tons from Two Harbors. The *Henry C. Frick* was the first vessel of the season out of Duluth. The weekly tonnage flow will increase rapidly from here on. Shippers expect to move more than 100 million tons during the 1953 season for a new record. Meanwhile, pending volume flow from the upper lakes, lower lake docks and furnaces are carrying sufficient ore in stock to support capacity blast furnace operations without interruption.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 180

Cleveland—Oven foundry coke demand has increased noticeably in this district since February. Explanation for this is found in the fact that while foundry operations continue spotty, over-all foundry activity is improved. This is especially true as regards shops producing castings for the automotive and appliance industries. While there is no coke surplus in the district, neither is there any noticeable shortage so that the market gives the appearance of running along on even keel. No talk is heard here of any projected change in prices, either up or down. Some easiness is reported in the coal market, however, with lower prices on coal rumored a possibility, chiefly on steam grades.

Semifinished Steel . . .

Semifinished Prices, Page 184

Boston — Bids close Apr. 20 on 5000 tons of carbon steel billets, Watertown arsenal. Billets are to be 16 to 20 inches square and the inquiry is covered by inv. 153-B, commanding officer.

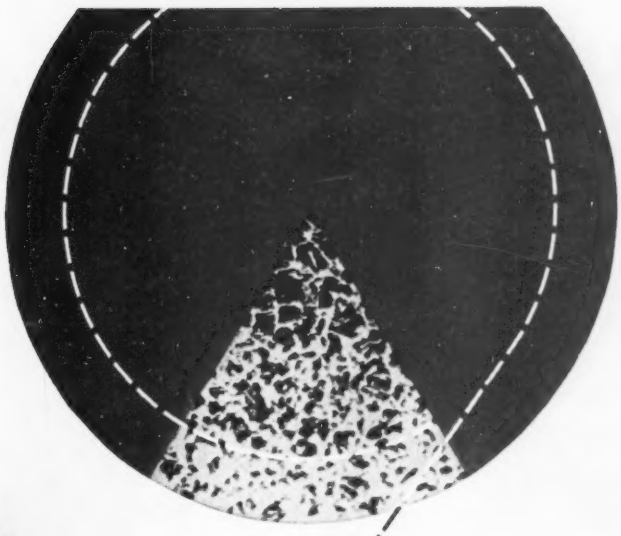
Pittsburgh — Steelmaking operations in this district were twice hit last week by developments that cut deeply into ingot production. No. 3 openhearth shop of U.S. Steel Corp. at Homestead, which turns out 3000 tons daily, was closed Mar. 28 after preliminary inspection by American Bridge Division engineers revealed that a more complete inspection was advisable.

While the inspection period is only two weeks it was indicated that a more lengthy shutdown might be experienced. Much will depend upon findings of engineers. Current shutdown lopped off about 10 per cent of the company's ingot tonnage.

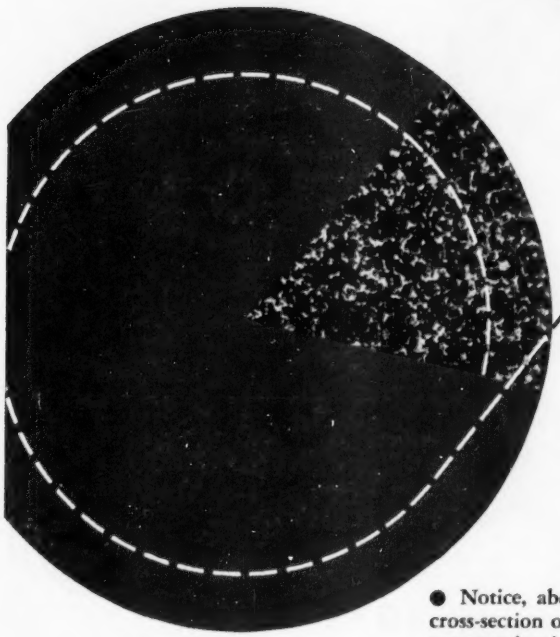
Close on the heels of this curtailment came a wildcat strike of trainmen on the Union railroad serving U.S. Steel plants in this area. The corporation blast furnaces were banked early in the week with open hearths following closely behind in complete cessation of operations at Homestead, Duquesne, Clairton and Edgar Thomson works. It is estimated that approximately 25,000 tons of steel daily were lost during the strike.

Youngstown—District steel operating rate is 106 per cent of capacity, with three bessemers, 72 open hearths and 25 blast furnaces in operation. Some blast furnaces need repairs and may be forced to blow out soon, affecting the supplies of hot

(*Turn to page* 183)



The "decarb" (light-colored) area in the ordinary heat-treated bar at right must usually be removed before parts can be made from the stock.



Notice that this Republic carbon corrected alloy steel bar has had full carbon content restored to outer edges by carbon correction.

HERE IS WHERE Republic Carbon-Corrected Alloy Steel Bars help you make a profit

● Notice, above at the right, the "decarb" area in the outer edge of the cross-section of a cold drawn alloy steel bar as ordinarily heat treated. Then compare it with the cross-section below at the left. Notice how the carbon has been restored by carbon correction even to the extreme outer circumference.

Here, in the outer rim of Republic Carbon-Corrected Alloy Steel Bars, is the profit-area for your machine tools . . . the part of the bar you don't have to machine away into chips and shavings.

Let our Republic 3-Dimension Metallurgical Service work with your metallurgists and production men to adapt Republic Carbon-Corrected Cold Drawn Alloy Steel Bars to your products. Your Republic Steel salesman can arrange for the Republic Field Metallurgist to call at your convenience.

LAB FIELD MILL

3-DIMENSION Metallurgical Service

. . . combines the extensive experience and coordinated abilities of Republic's *Field, Mill* and *Laboratory* Metallurgists with the knowledge and skills of your own engineers. It has helped guide users of Alloy Steels in countless industries to the correct steel and its most efficient usage, IT CAN DO THE SAME FOR YOU.

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ALLOY STEEL BARS

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Plant: New Castle, Indiana

3-minute test for Pickle Tanks with

FERRO PICKLE PILLS

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waiting for you

Gone are the days when you had to wait for delivery on most punches and dies while they were made to order. *Now they wait for you.* You can order for immediate shipment from our stock 76 styles of punches and 65 styles of dies in round, flat, oval, and square sizes to fit most makes of presses.

SEND FOR CURRENT CATALOG SHEETS

T. H. LEWTHWAITE MACHINE CO., INC.

310 East 47th Street, New York 17, N. Y.

SINCE 1901

MOLINE "Hole-Hog" SPECIALLY DESIGNED MACHINE TOOLS

have cut production costs for American Industry.

DRILLING • BORING
HONING • TAPPING
and Special Machines

MOLINE TOOL CO.
HOLE-HOG
MOLINE, ILLINOIS

Boring V-8 Engine Cylinders

Semifinished Steel . . .

(*Continued from page* 180)

iron available for the steel furnaces.

Steel plants and blast furnaces are in the best shape to produce in years, with excellent supplies of scrap compared with a year ago when they were scraping bottom of stockpiles. Iron ore and coal and coke supplies are equally adequate.

Youngstown—Henry A. Roemer Jr., president, Sharon Steel Corp., told stockholders last week the steel business should be "very good" the rest of this year, barring a strike. He said Sharon Steel set many new records in January and probably will register more for March. Mr. Roemer expects Sharon's large expenditures for plant and equipment improvements to pay off handsomely in the future. He said the company's investment in titanium is proving even better than expected.

Detroit—Steel production by Ford Motor Co. set daily, weekly and monthly production records in March.

Steel Shipments Up

January movement gains 7 per cent over year ago. Warehouses in first place as buyers.

New York—Steel products shipments in January this year were 7,067,656 net tons, increase of 478,463 tons or 7 per cent over shipments in January 1952, the American Iron & Steel Institute reports.

January movement was about 88,000 tons less than the highest monthly level established last October and practically repeated in December 1952. However, it was substantially higher than in any other month of the past year, and was equal to an annual shipment rate of about 88 million tons. This compares with record annual shipments of 78.9 million tons in 1951.

Warehouses continue to hold first place as buyers during January, getting over 1.3 million tons, or 19.1 per cent of the total shipments.

The automotive industry obtained nearly 1.3 million tons in the month, highest for any month since October 1950. This January figure represented 18.4 per cent of total shipments and compares with 16.2 per cent in all of last year.

Railroad transportation received nearly 427,500 tons in the month, the largest tonnage since March 1952. Appliance and utensil manufacturers received almost 170,600 tons, greatest amount since May 1951. These were respectively 6.1 and 2.4 per cent of the total shipments during the month.

Makers of electrical machinery and equipment obtained over 179,000 tons, largest tonnage since August 1951 and 2.6 per cent of the total monthly movement.

Shipments to makers of guns, tanks and associated military equipment were 202,459 tons in January, somewhat less than in other recent months but 27,000 tons above the monthly average for all of last year.

Direct shipments from the mills for export in January at 239,097 tons were the smallest since September 1951. They constituted 3.4 per cent of the total, comparing with 4.9 per cent for all of 1952.

FORD uses 102 Wheelabrators in its various plants

FORD CLEVELAND FOUNDRY

Relies on 2 Continuous Wheelabrator Tumblasts for Fast, Continuous, High Volume Cleaning

• *These machines handle a combined tonnage of 20-24 tons per hour of gray iron castings*

"Automation"—Ford's terminology for automatic, high production operations—is a cost-saving reality in the small casting cleaning department of Ford's new Cleveland foundry. Contributing importantly to this efficient operation is the high speed, low cost cleaning production effected without manual handling by two Continuous Wheelabrator Tumblasts. Cleaning speed is synchronized with the foundry's production.

American pioneered the first continuous blast mill, and the sound engineering design and performance of this machine have been proved to the satisfaction of users in some of the nation's largest industries.

GET THE COMPLETE STORY

Let us show you how one of these machines can be applied with cost-saving economy to your particular cleaning problem. One of our nearby field engineers will be glad to discuss this at your convenience. In the meantime, write for literature.

American Wheelabrator AIRLESS BLAST CLEANING

WHEELABRATOR & EQUIPMENT CORP.

509 S. Byrkit St., Mishawaka, Ind.

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

Semifinished and Finished Steel Products

Mill prices as reported to STEEL Apr. 2, 1953, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on pages 184-185.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$81.00
Munhall,Pa. U5 .....84.00
Seattle S24 .....75.00

INGOTS, Alloy (NT)
Detroit R7 .....$57.00
Fontana,Calif. K1 ....83.00
Houston S5 .....65.00
Midland,Pa. C18 .....57.00
Munhall, Pa. U5 .....57.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$59.00
ClairtonPa. U5 .....59.00
Ensley,Ala. T2 .....59.00
Fairfield,Ala. T2 .....59.00
Fontana,Calif. K1 ....78.00
Gary,Ind. U5 .....59.00
Johnstown,Pa. B2 ....59.00
Lackawanna,N.Y. B2 ..59.00
Munhall,Pa. U5 .....59.00
So.Chicago,Ill. U5 ....59.00
SoDuquesne,Pa. U5 ..59.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$70.50
Buffalo R2 .....70.50
Canton,O. R2 .....70.50
Clairton,Pa. U5 .....70.50
Cleveland R2 .....70.50
Conshohocken,Pa. A3 ..77.50
Detroit R7 .....73.50
Ensley,Ala. T2 .....70.50
Fairfield,Ala. T2 .....70.50
Fontana,Calif. K1 ....89.50
Gary,Ind. U5 .....70.50
Geneva,Utah C11 .....70.50
Houston S5 .....78.50
Johnstown,Pa. B2 ....70.50
Lackawanna,N.Y. B2 ..70.50
LosAngeles B3 .....89.50
Munhall,Pa. U5 .....70.50
Seattle B3 .....89.50
So.Chicago R2,U5,W14..70.50
So.Duquesne,Pa. U5 ...70.50
So.SanFrancisco B3 ..89.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....78.00
Buffalo R2 .....78.00
Canton, O. R2 .....78.00
Canton,O. T7 .....78.60
Conshohocken,Pa. A3 ..83.00
Detroit R7 .....79.00
Fontana,Calif. K1 ....95.00
Gary,Ind. U5 .....78.00
Houston S5 .....84.00
Ind.Harbor,Ind. Y1 ....78.00
Johnstown,Pa. B2 ....78.00
Lackawanna,N.Y. B2..78.00
LosAngeles B3 .....96.00
Massillon,O. R2 .....78.00
Midland,Pa. C18 .....78.00
Munhall,Pa. U5 .....78.00
So.Chicago R2,U5,W14..78.00
So.Duquesne,Pa. U5 ...78.00
Struthers,O. Y1 .....78.00
Warren,O. C17 .....78.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....87.50
Canton,O. R2 .....87.50
Cleveland R2 .....87.50
Fontana,Calif. K1 ....108.50
Gary,Ind. U5 .....87.50
Massillon,O. R2 .....87.50
So.Chicago,Ill. R2 ....87.50
So.Duquesne,Pa. U5 ..87.50

SHEETS BARS (NT)
Fontana,Calif. K1 ...93.18

SKELP
Aliquippa,Pa. J5 .....3.65
Munhall,Pa. U5 .....3.55
Warren,O. R2 .....3.55
Youngstown R2, U5 ....3.55

WIRE RODS
Alton,Ill. L1 .....4.70
AlabamaCity,Ala. R2 ..4.325
Buffalo W12 .....4.325
Cleveland A7 .....4.325
Donora,Pa. A7 .....4.325
Fairfield,Ala. T2 .....4.325
Fontana,Calif. K1 ....5.125
Houston S5 .....4.725
Johnstown,Pa. B2 ....4.325
Joliet,Ill. A7 .....4.325
KansasCity,Mo. S5 ....4.665
LosAngeles B3 .....5.125
Minnequa,Colo. C10 ...4.575
Monessen,Pa. P7 .....4.525
No.Tonawanda,N.Y.B11 4.325
Pittsburg,Calif. C11 ...4.975
Portsmouth,O. P12 ....4.525
Roebling,N.J. R5 .....4.425
So.Chicago,Ill. R2 .....4.325
SparrowsPoint,Md. B2..4.425
Sterling,Ill.(1) N15 ...4.325
Struthers,O. Y1 .....4.325
Torrance,Calif. C11 ...5.125
Worcester,Mass. A7 ...4.625

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ...4.675
Lackawanna,N.Y. B2 ..4.675
Munhall,Pa. U5 .....4.675
So.Chicago,Ill. U5 ....4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity, Ala. R2 ..3.85
Aliquippa,Pa. J5 .....3.85
Bessemer,Ala. T2 .....3.85
Bethlehem,Pa. B2 .....3.90
Clairton,Pa. U5 .....3.85
Fairfield,Ala. T2 .....3.85
Fontana,Calif. K1 .....4.50
Gary,Ind. U5 .....3.85
Geneva,Utah C11 .....3.85
Houston S5 .....4.25
Ind.Harbor,Ind. I-2 ....3.85
Johnstown,Pa. B2 .....3.90
KansasCity,Mo. S5 ....4.45
Lackawanna,N.Y. B2 ..3.90
LosAngeles B3 .....4.45
Minnequa,Colo. C10 ....4.30
Munhall,Pa. U5 .....3.85
Niles,Calif.(22) P1 .....4.56
Phoenixville,Pa. P4 ....4.95
Seattle B3 .....4.50
So.Chicago,Ill. U5, W14..3.85
So.SanFrancisco B3 ....4.40
Torrance,Calif. C11 ....4.45
Weirton,W.Va. W6 .....4.10

Wide Flange
Bethlehem,Pa. B2 .....3.90
Clairton,Pa. U5 .....3.85
Fontana,Calif. K1 .....5.05
Johnstown,Pa. B2 .....3.90
Lackawanna,N.Y. B2 ..3.90
Munhall,Pa. U5 .....3.85
So.Chicago,Ill. U5 .....3.85

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.725
Fontana,Calif. K1 .....5.925
Gary,Ind. U5 .....4.725
Munhall,Pa. U5 .....4.725
So.Chicago,Ill. U5 ....4.725

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.80
Bessemer,Ala. T2 .....5.80
Bethlehem,Pa. B2 .....5.80
Clairton,Pa. U5 .....5.80
Fairfield,Ala. T2 .....5.80
Fontana,Calif. K1 .....6.45
Gary,Ind. U5 .....5.80
Geneva,Utah C11 .....5.80
Ind.Harbor,Ind. I-2 ....5.80
Ind.Harbor,Ind. Y1 .....6.30
Johnstown,Pa. B2 .....5.80
Lackawanna,N.Y. B2 ..5.80
LosAngeles B3 .....6.35
Munhall,Pa. U5 .....5.80
Seattle B3 .....6.40
So.Chicago,Ill. U5 .....5.80
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 .....6.30

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.80
Lackawanna,N.Y. B2 ..5.80
Munhall,Pa. U5 .....5.75
So.Chicago,Ill. U5 .....5.75

BEARING PILES
Munhall,Pa. U5 .....3.85
So.Chicago,Ill. U5 .....3.85

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.95
Bessemer,Ala. T2 .....5.95
Clairton,Pa. U5 .....5.95
Cleveland J5, R2 .....5.95
Conshohocken,Pa. A3 ...6.20
Ecorse,Mich. G5 .....6.90
Fairfield,Ala. T2 .....5.95
Fontana,Calif.(30) K1 ..6.65
Gary,Ind. U5 .....5.95
Geneva,Utah C11 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 ....6.45
Johnstown,Pa. B2 .....5.95
Munhall,Pa. U5 .....5.95
Pittsburgh J5 .....5.95
Seattle B3 .....6.85
Sharon,Pa. S3 .....5.95
So.Chicago,Ill. U5 .....5.95
SparrowsPoint,Md. B2 ..5.95
Warren,O. R2 .....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

PLATES, Open-Hearth Alloy
Claymont,Del. C22 .....5.35
Coatesville,Pa. L7 .....5.75
Conshohocken,Pa. A3 ..5.55
Fontana,Calif. K1 .....6.20
Gary,Ind. U5 .....5.25
Johnstown,Pa. P2 .....5.25
Munhall,Pa. U5 .....5.25
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.25
SparowsPoint,Md. B2 ..5.25

FLOOR PLATES
Cleveland J5 .....4.95
Conshohocken,Pa. A3 ..4.95
Ind.Harbor,Ind. I-2 ....4.95
Munhall,Pa. U5 .....4.95
So.Chicago,Ill. U5 .....4.95

PLATES, Ingot Iron
Ashland,c.l. (15) A10 ..4.15
Cleveland,c.l. R2 .....4.50
Warren,O.,c.l. R2 .....4.50

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.90
Aliquippa,Pa. J5 .....3.90
Ashland,Ky. (15) A10 ..3.90
Bessemer,Ala. T2 .....3.90
Clairton,Pa. U5 .....3.90
Claymont,Del. C22 .....4.35
Cleveland J5, R2 .....3.90
Coatesville,Pa. L7 .....4.35
Conshohocken,Pa. A3 ..4.35
Ecorse,Mich. G5 .....4.45
Fairfield,Ala. T2 .....3.90
Fontana,Calif.(30) K1..4.55
Gary,Ind. U5 .....3.90
GraniteCity,Ill. G4 .....4.60
Geneva,Utah C11 .....3.90
Harrisburg,Pa. C5 .....6.50
Houston S5 .....4.30
Ind.Harbor,Ind. I-2, Y1.3.90
Johnstown,Pa. B2 .....3.90
Lackawanna,N.Y. B2 ..3.90
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 .....3.90
Pittsburgh J5 .....3.90
Seattle B3 .....4.80
Sharon,Pa. S3 .....4.15
So.Chicago,Ill. U5, W14..3.90
SparrowsPoint,Md. B2 ..3.90
Steubenville,O. W10 ....3.90
Warren,O. R2 .....3.90
Weirton,W.Va. W6 .....4.20
Youngstown R2, U5, Y1..3.90

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.70
Geneva,Utah, C11 .....5.05

PLATES, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa. B14 .....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.95
Aliquippa,Pa. J5 .....3.95
Alton,Ill. L1 .....4.50
Atlanta,Ga. A11 .....4.50
Bessemer,Ala. T2 .....3.95
Buffalo R2 .....3.95
Canton,O. R2 .....3.95
Clairton,Pa. U5 .....3.95
Cleveland R2 .....3.95
Detroit R7 .....4.10
Ecorse,Mich. G5 .....4.30
Emeryville,Calif. J7 ....4.70
Fairfield,Ala. T2 .....3.95
Fontana,Calif. K1 ....4.65
Gary,Ind. U5 .....3.95
Houston S5 .....4.35
Ind.Harbor,Ind. I-2, Y1.3.95
Johnstown,Pa. B2 .....3.95
KansasCity,Mo. S5 .....4.55
Lackawanna,N.Y. B2 ..3.95
LosAngeles B3 .....4.65
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.40
Niles,Calif. P1 .....4.65
N.Tonawanda,N.Y. B11..3.95
Pittsburg,Calif. C11 ....4.65
Pittsburgh J5 .....3.95
Seattle B3, N14 .....4.70
So.Chicago R2,U5,W14 ..3.95
So.Duquesne,Pa. U5 ...3.95
So.SanFran.,Calif. B3...4.70
Sterling,Ill. N15 .....4.55
Struthers,O. Y1 .....3.95
Torrance,Calif. C11 ....4.65
Weirton,W.Va. W6 .....4.10
Youngstown R2, U5 ....3.95

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....3.95
Atlanta A11 .....4.50
Niles,Calif. P1 .....4.65
SanFrancisco S7 .....5.00

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....4.15

BARS,Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.675
Buffalo R2 .....4.675
Canton,O. T7 .....4.72
Canton,O. R2 .....4.675
Clairton,Pa. U5 .....4.675
Detroit R7 .....4.825
Ecorse,Mich. G5 .....5.025
Fontana,Calif. K1 ....5.725
Gary,Ind. U5 .....4.675
Houston S5 .....5.075
Ind.Harbor,Ind. I-2, Y1.4.675
Johnstown,Pa. B2 .....4.675
KansasCity,Mo. S5 ....5.275
Lackawanna,N.Y. B2 ..4.675
LosAngeles B3 .....5.725
Massillon,O. R2 .....4.675
Midland,Pa. C18 .....4.675
So.Chicago R2,U5, W14..4.675
So.Duquesne,Pa. U5 ..4.675
Struthers,O. Y1 .....4.675
Warren,O. C17 .....4.675
Youngstown U5 .....4.675

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.925
Gary,Ind. U5 .....4.925
Youngstown U5 .....4.925

BARS & SMALL SHAPES, H. R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.925
Bessemer,Ala. T2 .....5.925
Bethlehem,Pa. B2 .....5.925
Clairton,Pa. U5 .....5.925
Cleveland R2 .....5.925
Ecorse,Mich. G5 .....6.675
Fairfield,Ala. T2 .....5.925
Fontana,Calif. K1 ....6.975
Gary,Ind. U5 .....5.925
Ind.Harbor,Ind. I-2 ...5.925
IndianaHarbor,Ind. Y1.6.425
Johnstown,Pa. B2 ....5.925
Lackawanna,N.Y. B2 ..5.925
LosAngeles B3 .....6.625
Pittsburgh J5 .....5.925
Seattle B3 .....6.675
So.Duquesne,Pa. U5 ..5.925
So.SanFrancisco B3 ...6.675
Struthers,O. Y1 .....6.425
Youngstown U5 .....5.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ...4.925
BeaverFalls,Pa. R2 ...4.925
BeaverFalls,Pa. M12 ..4.925
Buffalo B5 .....4.975
Camden,N.J. P13 ....5.375
Carnegie,Pa. C12 ....4.925
Chicago B5 .....4.925
Chicago W18 .....4.925
Cleveland A7, C20 ....4.925
Detroit P17, R7 .....5.075
Detroit B5 .....5.125
Donora,Pa. A7 .....4.926
Elyria,O. W8 .....4.925
FranklinPark,Ill. N5 ..4.925
Gary,Ind. R2 .....4.925
GreenBay,Wis. P7 ....4.925
Hammond,Ind. L2,M13.4.925
Hartford,Conn. R2 ....5.475
LosAngeles R2 .....6.375
Mansfield,Mass. B5 ...5.475
Massillon,O. R2, R8 ..4.925
Monaca,Pa. S17 .....4.925
Newark,N.J. W18 ....5.375
Plymouth,Mich. P5 ...5.175
Pittsburgh J5 .....4.925
Putnam,Conn. W18 ...5.475
Readville,Mass. C14 ...5.475
St.Louis,Mo. M5 .....5.30
So.Chicago,Ill. W14 ...4.925
SpringCity,Pa. K3 ....5.375
Struthers,O. Y1 .....4.925
Waukegan,Ill. A7 .....4.925
Youngstown Y1 .....4.925
Youngstown F3 .....4.925

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....6.00
BeaverFalls,Pa. M12 ...6.00
Bethlehem,Pa. B2 .....6.00
Buffalo B5 .....6.00
Camden,N.J. P13 .....6.40
Canton,O. R2 .....6.00
Canton,O. T7 .....5.99
Carnegie,Pa. C12 .....6.00
Chicago B5 .....6.00
Chicago W18 .....6.00
Cleveland A7 .....6.05
Cleveland C20 .....6.00
Detroit P17, R7 .....6.15
Detroit B5 .....6.20
Donora,Pa. A7 .....6.05
Elyria,O. W8 .....6.00
Gary,Ind. R2 .....6.00
Hammond,Ind. L2, M13.6.00
Hartford,Conn. R2 .....6.45
Lackawanna,N. Y. B2 ..6.00
Mansfield,Mass. B5 ....6.45
Massillon,O. R2 R8 ....6.00
Midland,Pa. C18 .....6.00
Monaca,Pa. S17 .....6.00
Newark,N.J. W18 .....6.35
Plymouth,Mich. P5 .....6.20
So.Chicago,Ill. R2, W14.6.00
SpringCity,Pa. K3 .....6.20
Struthers,O. Y1 .....6.00
Warren,O. C17 .....6.00
Waukegan,Ill. A7 .....6.05
Worcester,Mass. A7 ....6.35
Youngstown Y1 .....6.00
Youngstown F3 .....6.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala R2 ...3.95
Atlanta A11 .....4.50
Buffalo R2 .....3.95
Cleveland R2 .....3.95
Emeryville,Calif. J7 ....4.70
Fairfield,Ala. T2 .....3.95
Fontana,Calif. K1 .....4.65
Gary,Ind. U5 .....3.95
Houston S5 .....4.35
Ind.Harbor,Ind. I-2, Y1.3.95
Johnstown,Pa. B2 .....3.95
KansasCity,Mo. S5 .....4.55
Lackawanna,N.Y. B2 ...3.95
LosAngeles B3 .....4.65
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.65
Pittsburg,Calif. C11 ...4.65
Pittsburgh J5 .....3.95
SandSprings,Okla. S5 ..4.86
Seattle B3, N14 .....4.70
So.Chicago,Ill. R2 .....3.95
So.Duquesne,Pa. U5 ....3.95
So.SanFrancisco B3 ....4.70
SparrowsPoint,Md. B2...3.95
Sterling,Ill.(1) N15 ....4.70
Struthers,O. Y1 .....3.95
Torrance,Calif. C11 ....4.65
Youngstown R2, U5 ....3.95

BARS, Reinforcing
(Fabricated; to consumers)
Huntington,W.Va. W7 ...5.50
Johnstown, ¼-1" B2 ....5.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Div., H. K. Porter Co.
B14 A. M. Byers Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept., Wickwire Spencer Steel Division
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

KansasCity S5 .....6.05
LosAngeles B3 .....5.45
Marion,O. P11 .....5.25
Seattle B3, N14 .....5.80
SandSprings S5 .....6.45
So.SanFrancisco B3 ....5.45
SparrowsPt. ¼-1" B2 ..5.25
Williamsport,Pa. S19 ...5.35

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ...4.75
ChicagoHts.(3,4) I-2 ...4.75
Franklin,Pa.(3,4) F5 ...4.75
FortWorth,Tex.(26) T4..4.85
Huntngt,W.Va.(3) W7..5.75
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....4.05
Tonawanda(3,4) B12 ..5.00
Williamsport(3) S19 ...5.25
William-port,Pa. S19 ...5.35

BARS, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa.(S.R.) B14.9.60
Economy,Pa.(D.R.)B14 11.90
Economy(Staybolt)B14 12.20
McK.Rks.(Staybolt) L5 14.50
McK.Rks.(S.R.) L5 ....9.60
McK.Rks.(D.R.) L5 ..13.00

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ..3.775
Ashland,Ky.(8) A10 ...3.775
Butler,Pa. A10 .....3.775
Cleveland J5, R2 ....3.775
Conshohocken,Pa. A3 ..4.175
Detroit M1 .....4.40
Ecorse,Mich. G5 .....3.975
Fairfield,Ala. T2 .....3.775
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....3.775
Geneva,Utah C11 .....3.875
GraniteCity,Ill. G4 ....4.30
Ind.Harbor,Ind. I-2, Y1 3.775
Irvin,Pa. U5 .....3.775
Lackawanna,N.Y. B2 ..3.775
Munhall,Pa. U5 .....3.775
Niles,O. N12 .....5.425
Pittsburg,Calif. C11 ..4.475
Pittsburgh J5 .....3.775
Sharon,Pa. S3 .....4.175
So.Chicago,Ill. W14 ...3.775
SparrowsPoint,Md. B2.3.775
Steubenville,O. W10 ..3.775
Torrance,Calif. C11 ...4.475
Warren,O. R2 .....3.775
Weirton,W.Va. W6 ....3.775
WestLeechburg,Pa. A4..3.925
Youngstown U5, Y1 ..3.775

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ..4.925
Dover,O. R1 .....5.825
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.675
Torrance,Calif. C11 ...5.575

SHEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy
Cleveland J5, R2 ....5.675
Conshohocken,Pa. A3 ..5.925
Ecorse,Mich. G5 .....6.225
Fairfield,Ala. T2 ....5.675
Fontana,Calif. K1 ....6.775
Gary,Ind. U5 .....5.675
Ind.Harbor,Ind. I-2 ..5.675
Ind.Harbor,Ind. Y1 ...6.175
Irvin,Pa. U5 .....5.675
Lackawanna(35) B2 ..5.675
Munhall U5 .....5.675
Pittsburgh J5 .....5.675
Sharon,Pa. S3 .....5.675
So.Chicago,Ill. U5 ....5.675
SparrowsPoint(36) B2..5.675
Warren,O. R2 .....5.675
Weirton,W.Va. W6 ....6.025
Youngstown U5 .....5.675
Youngstown Y1 .....6.175

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ....6.925
Ecorse,Mich. G5 .....7.475
Fontana,Calif. K1 ....7.875
Gary,Ind. U5 .....6.925
IndianaHarbor,Ind. Y1.7.425
IndianaHarbor,Ind. I-2.6.925
Irvin,Pa. U5 .....6.925
Lackawanna(37) B2 ..6.925
Pittsburgh J5 .....6.925
SparrowsPoint(38) B2..6.925
Warren,O. R2 .....6.925
Weirton,W.Va. W6 ....7.275
Youngstown Y1 .....7.425

SHEETS, Cold-Rolled Steel (Commercial Quality)
Butler,Pa. A10 .....4.575
Cleveland J5, R2 ....4.575
Ecorse,Mich. G5 .....4.775
Fairfield,Ala. T2 ....4.575
Follansbee,W.Va. F4 ..5.575
Fontana,Calif. K1 ....5.675
Gary,Ind. U5 .....4.575
GraniteCity,Ill. G4 ....5.275
Ind.Harbor,Ind. I-2,Y1.4.575
Irvin,Pa. U5 .....4.575
Lackawanna,N.Y. B2..4.575
Middletown,O. A10 ....4.575
Pittsburg,Calif. C11 ...5.525
Pittsburgh J5 .....4.575
SparrowsPoint,Md. B2..4.575
Steubenville,O. W10 ...4.575
Warren,O. R2 .....4.575
Weirton,W.Va. W6 ....4.575
WestLeechburg,Pa. A4 ..5.45
Youngstown Y1 .....4.575

SHEETS, Galv'd No. 10 Steel
AlabamaCity,Ala. R2..5.075
Ashland,Ky.(8) A10 ...5.075
Canton,O. R2 .....5.075
Delphos,O. N16 .....5.675
Dover,O. R1 .....5.775
Fairfield,Ala. T2 .....5.075
Gary,Ind. U5 .....5.075
GraniteCity,Ill. G4 ....5.50
Ind.Harbor,Ind. I-2 ...5.075
Irvin,Pa. U5 .....5.075
Kokomo,Ind.(13) C16 ..5.475
MartinsFerry,O. W10 ...5.075
Niles,O. N12 .....6.275
Pittsburg,Calif. C11 ...5.825
SparrowsPoint,Md. B2 .5.075
Steubenville,O. W10 ...5.075
Torrance,Calif. C11 ...5.825
Weirton,W.Va. W6 ....5.075

SHEETS, Galvanized No. 10, High-Strength Low-Alloy
Irvin,Pa. U5 .....7.625
SparrowsPoint(39) B2..7.775

SHEETS, Galvannealed Steel
Canton,O. R2 .....5.625
Irvin,Pa. U5 .....5.625
Kokomo,Ind.(13) C16 ..6.025
Niles,O. N12 .....6.825

SHEETS ZINCGRIP Steel No. 10
Butler,Pa. A10 .....5.325
Middletown,O. A10 ...5.325

SHEETS, Electro Galvanized
Cleveland R2 (28) 5.925
Niles,O. R2 (28) 5.925
Weirton,W.Va. W6 ....5.775

SHEETS, Well Casing
Fontana,Calif. K1 .....5.34

BLUED Stock, 29 ga.
Yorkville,O. W10 .....7.00
Follansbee,W.Va. F4 ...7.10
Follansbee (23) F4 ....6.425

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ..4.925
Cleveland R2 .....4.925
Gary,Ind. U5 .....4.925
GraniteCity,Ill. G4 ....5.625
Ind.Harbor,Ind. I-2 ...4.925
Irvin,Pa. U5 .....4.925
Middletown,O. A10 ....4.925
Youngstown Y1 .....4.925

BLACK PLATE (Base Box)
Aliquippa,Pa. J5 .....$6.50
Fairfield,Ala. T2 .....6.60
Gary,Ind. U5 .....6.50
GraniteCity,Ill. G4 .....6.70
Ind.Harbor,Ind. I-2, Y1.6.50
Irvin,Pa. U5 .....6.50
Niles,O. R2 .....6.50
Pittsburg,Calif. C11 ....7.25
SparrowsPoint,Md. B2 ..6.60
Warren,O. R2 .....6.50
Weirton,W.Va. W6 ....6.50
Yorkville,O. W10 .....6.50

HOLLOWARE ENAMELING Black Plate (29 gage)
Follansbee,W.Va. F4 ...6.10
Gary,Ind. U5 .....6.10
GraniteCity,Ill. G4 .....6.30
Ind.Harbor,Ind. Y1 ....6.10
Irvin,Pa. U5 .....6.10
Yorkville,O. W10 .....6.35

SHEETS, Culvert	Cu No. 16	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.875	....	
Canton,O. R2	5.925	6.375	
Fairfield,Ala. T2	5.875	6.125	
Gary,Ind. U5	5.875	6.125	
Ind.Harbor I-2	5.875	6.125	
Irvin,Pa. U5	5.875	6.125	
Kokomo,Ind. C16	6.525	....	
MartinsFy.,O.W10	5.875	....	
Pittsburg,Cal.C11	6.625	....	
SparrowsPt. B2	5.875	....	
Torrance,Cal.C11	6.625	....	

SHEETS, Culvert, No. 16 Pure Iron
Ashland,Ky. A10 .....6.125
Fairfield,Ala. T2 .....6.125
MartinsFerry,O. W10 ...6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier
Ashland,Ky.(8) A10 ..4.025
Cleveland R2 .....4.375
Ind.Harbor,Ind. I-2 ...4.025
Warren,O. R2 .....4.375

SHEETS, Cold-Rolled Ingot Iron
Butler,Pa. A10 .....5.075
Cleveland R2 .....5.175
Middletown,O. A10 ....5.075
Warren,O. R2 .....5.175

SHEETS, Galvanized Ingot Iron No. 10 flat
Ashland,Ky.(8) A10 ...5.325
Canton,O. R2 .....5.825

SHEETS, ZINCGRIP Ingot Iron
Butler,Pa. A10 .....5.575
Middletown,O. A10 ....5.575

SHEETS, ALUMINIZED
Butler,Pa. A10 .....8.425

MANUFACTURING TERNES (Special Coated)
Fairfield,Ala. T2 .....$7.85
Gary,Ind. U5 .....7.75
Irvin,Pa. U5 .....7.75
Yorkville,O. W10 .....7.75

SHEETS, LT. Coated Ternes, 6 lb
Yorkville,O. W10 .....$8.65

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)
Gary,Ind. U5 .....$9.75
Yorkville,O. W10 .....9.75

SHEETS, Long Terne Steel (Commercial Quality)
BeechBottom,W.Va.W10 5.475
Gary,Ind. U5 .....5.475
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....5.475
Niles,O. N12 .....6.275
Weirton,W.Va. W6 ....5.475

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ....5.875

ROOFING SHORT TERNES (8 lb Coated)
Gary,Ind. U5 .....9.75

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1.	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	...
Weirton,W.Va.W6	8.70	8.95
Yorkville,O. W10.	8.70	8.95

STRIP, Hot-Rolled High-Strength Low-Alloy
Bessemer,Ala. T2 .....5.65
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.30
Fairfield,Ala. T2 .....5.65
Fontana,Calif. K1 .....6.55
Gary,Ind. U5 .....5.65
Ind.Harb.,Ind. I-2 .....5.65
Ind.Harbor,Ind. Y1 ....6.15

STRIP, Hot-Rolled High-Strength Low-Alloy
Cleveland J5 .....7.45
Cleveland A7 .....7.30
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.15
Lackawanna,N.Y. B2 ..7.90
Sharon,Pa. S3 .....7.30
SparrowsPoint,Md. B2 ..7.90
Warren,O. R2 .....7.30
Weirton,W.Va. W6 ....7.95
Youngstown Y1 .....7.80

STRIP, Hot-Rolled Carbon
Ala.City,Ala.(27) R2 ..3.725
Alton,Ill. L1 .....4.20
Ashland,Ky.(8) A10 ...3.725
Atlanta A11 .....4.275
Bessemer,Ala. T2 .....3.725
Bridgeport,Con.(10)B15 4.225
Buffalo(27) R2 .....3.725
Butler,Pa. A10 .....3.725
Carnegie,Pa. S18 .....4.225
Conshohocken,Pa. A3 ..4.125
Detroit M1 .....4.40
Ecorse,Mich. G5 .....4.025
Fairfield,Ala. T2 .....3.725
Fontana,Calif. K1 ....5.175
Gary,Ind. U5 .....3.725

(Turn to page 188)

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	...	...
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut lengths ⅓c lower)	Arma- Field	ture	Elec-	Motor	Dyna- me
BeechBottom W10 (cut lengths)	...	...	7.85	9.10	9.90
BrackenridgePa. A4	...	...	8.35	9.60	10.40
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,Ind. I-2	7.55	7.85	(34)	(41)	...
Mansfield,O. E6 (cut lengths)	7.20	7.35	7.85	9.10	9.90
Niles,O. N12 (cut lengths)	7.05	7.35	7.85	...	...
Vandergrift,Pa. U5	...	7.85	8.35	9.60	10.40
Warren,O. R2	7.55	7.85	8.35	9.60	10.40
Zanesville,O A10	...	7.85	8.35	9.60	10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Length ⅓c lower) Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95	....	....	....
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95	....	....	....
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Beres,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
Bristol,Conn. W1	...	...	8.55	10.50	....
Carnegie,Pa. S18	...	7.65	8.25	10.20	12.50
Cleveland A7	5.10	7.30	8.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	8.50	....	....
Detroit D2	6.45	7.50	8.10	....	....
Dover,O. G6	5.70	7.65	8.25	10.20	12.50
FranklinPark,Ill. T6	5.45	7.45	8.40	10.35	12.65
Harrison,N.J. C18	...	...	8.55	10.50	12.80
Mattapan,Mass. T6	5.95	7.60	8.55	10.50	12.80
NewBritn.,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	8.25	10.20	....
NewCastle,Pa. E5	5.80	7.65	8.25	10.20	12.50
NewHaven,Conn. D2	6.70	7.60	8.20	....	....
NewYork W3	...	7.95	8.55	10.50	12.80
Pawtucket,R.I. N8:					
Cleve.orPitts.Base	...	7.65	8.25	10.20	12.50
Worcester,Mass.,Base.	6.30	7.95	8.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	8.25	10.20	12.50
Trenton,N.J. R5	...	7.95	8.55	10.50	12.80
Wallingford,Conn. W2	6.30	7.60	8.20	10.15	12.65
Warren,O. T5	6.20	7.65	8.25	10.20	12.50
Weirton,W.Va. W6	5.80	7.65	8.25	10.20	12.50
Worcester,Mass. A7	5.40	7.60	8.55	10.50	12.80
Worcester,Mass. T6	5.95	7.60	8.55	10.50	12.80
Youngstown C8	...	7.65	8.25	10.20	12.50
Spring Steel (Tempered)					
Trenton,N.J. R5 (29)	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30*	12.50*	15.35*
Youngstown C8	...	...	10.30	12.50	15.35

* Plus 1.575 per 100 lb.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 RhodeIsland Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Div.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
U4 Universal Cyclops Steel
U5 United States Steel Corp.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West. Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

Tin Plate . . .

Tin Plate Prices, Page 185

New York—January shipments, totaling 269,597 tons, were up 5 per cent from the preceding month, when shipments totaled 256,206 tons, according to the Bureau of Census, Department of Commerce. Compared with a year ago, when shipments amounted to 234,272 tons, volume was up 15 per cent.

Food cans totaled 167,764 tons, against 158,612 tons in December 1952, and 143,997 tons in January, 1952. Non-food cans totaled 101,833 tons, against 97,594 tons in December, 1952, and 90,375 tons in January of that year.

Plates . . .

Plate Prices, Page 184

Boston—Underground tank fabricators, 1000 to 3000-gallon capacity, have plate and head inventories to permit stocking welded units for future delivery. Other shops have more narrow and light carbon plate tonnage, but heavy and wide carbon, clad and quality grades, are sold through second quarter. Weldment requirements are steady. Backlogs are maintained, but are under earlier peak. Considerable weldment tonnage is for priority defense requirements and will come under DMS set-asides. While clad prices have advanced, nickel-bearing and straight chromium grades, full impact of price decontrol is not expected to be felt until CMP controls disappear entirely on commercial tonnage June 30.

New York—Most plate producers are counting on certain carryover at the beginning of the third quarter, which means that they will have little unrated tonnage to offer during July. After that, however, they expect that the proposed Defense Materials System, which is to succeed the Controlled Materials Plan, will become fully effective. Most producers anticipate a continued good demand throughout the third quarter, especially in view of the good prospects in pipe line construction and in capital equipment generally. Shipyard activity is about the only major outlet, plate makers say, that is likely to show any appreciable drop. Actually, the trend has been easing for some time.

Philadelphia—Except for one high premium mill, eastern plate sellers are sold out for the second quarter and anticipate a brisk market in the succeeding three months. The exception can accept tonnage, especially in the light gages, for nearby shipment but has not reduced its price.

Pittsburgh—So long as military and defense-supporting industries maintain their strong demand, there seems little likelihood that much rolling time will be diverted from plates to sheets. While it is generally admitted some changes along these lines may be made in fourth quarter, for the present the continuous mills continue to roll plates. Producers are reluctant to make any moves that might result in re-establishing of controls, and they feel the quickest way to do that would be by toying with military allocations.

Birmingham—Even with relaxation of controls coming up, not too much is to be expected in plate supply improvement in this territory. Large scale users are wanting more tonnage and a substantial part of the district's output continues to go into steel pipe.

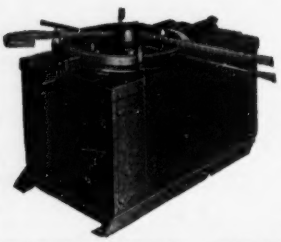
Seattle—Tank and boiler fabricators report an exceptional demand for figures but recent awards have been infrequent. Even small jobs are slow. Backlogs are lower. As a whole, conditions thus far, they state, have not been affected by the budget "freeze". Indications for an active season are favorable, several important projects being up for action shortly, the most important, an oil refining plant at Ferndale, Wash., involving 9000 tons plates, overall contract awarded to the Bechtol Corp., San Francisco. Important plate tonnages will also be required at the Arco, Idaho, reactor testing station, general contract to Utah Construction Co., Salt Lake City, Utah.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 189

Pittsburgh—Bolt and nut producers report that orders, tonnagewise, are coming in a slightly better rate than in the comparable period a year ago. Steel receipts from mills are better than at any time in recent months, and more favorable offerings are being made to customers. Tonnagewise,

WHEELING STEEL CORPORATION
WHEELING, WEST VIRGINIA
COP-R-LOY PIPE-SHEETS
Ductilite
THE MODERN TIN PLATE
LA BELLE CUT NAILS
WHEELING STEEL

KARDONG FOUR-WAY BENDER
For Concrete Reinforcing Bars
Model D-2

The Model D-2 Kardong Bender is a Four Direction Horizontal Bender. With this bender it is not necessary to turn bars over to make reverse or second bends on beam bars. The Model D-2 is made in two sizes, Model D-2 Standard 6-inch, which will bend bars around collars 2-inch to 6-inch, and Model D-2 Special 8-inch, which will bend bars around collars 2-inch to 8-inch. Capacity of both models, 1¼-inch Square Bars. The Model D-2 is a production bender for reinforcing steel fabricating shop. Ask for catalog of our complete line of reinforcing bar benders.
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receipts from the mills are pretty well balanced with orders from customers. Producers, however, are still complaining that the product mix isn't good. They are still short of adequate tonnage of large diameter material, though they agree receipts of larger sizes are improving.

Pig Iron . . .

Pig Iron Prices, Page 164

Boston—Pig iron inventories have improved to the point foundry and malleable shipments are off with basic iron supply more comfortable. The district blast furnace at Everett, Mass., will stock more iron this month. Currently, the melt is unchanged, well below capacity. Machine tool requirements are about holding steady with peak pressure passed.

New York—Pig iron sellers continue to express disappointment over the fact that gray iron foundry operations have not improved more noticeably. In fact, business at some shops, they say, is no better than it was earlier in the year. All this means, and particularly in view of the fact that consumer inventories are in generally good shape, that demand for iron is still dragging. Only in the basic grades is there any pressure and there is not too much demand for this type of iron in this district anyway.

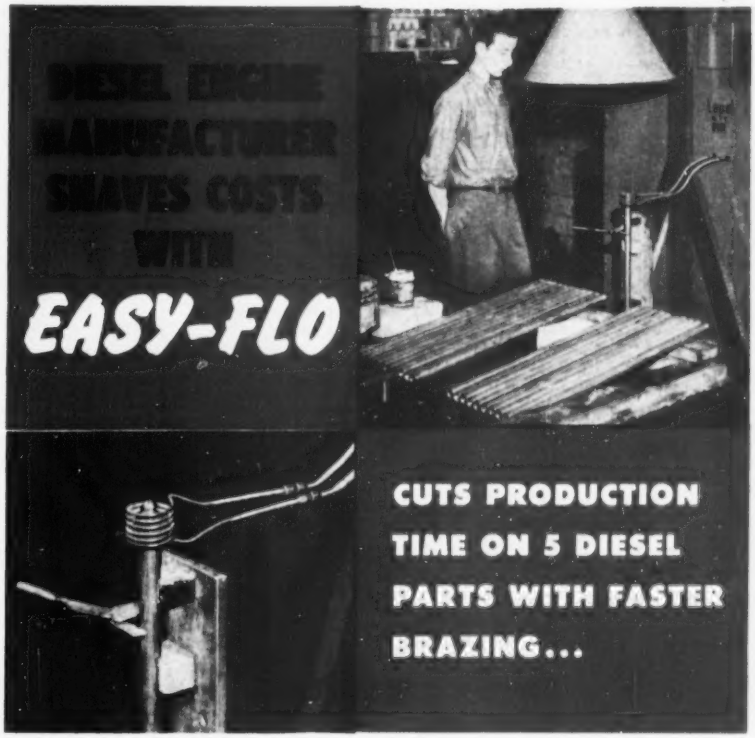
Buffalo—The merchant pig iron market continues to display strength. Weakness in other metals as result of the Korean peace move is not reflected in pig iron. Approximately 75 to 80 per cent of district iron output is going to the steelmaking furnaces. Automotive and building casters continue active buyers.

Philadelphia—Consumers of foundry pig iron are meeting with no difficulty in obtaining supplies provided they are willing to pay the extra freight for tonnage originating outside the district. But they find local supplies tighter, due in part to the fact some merchant producing capacity is down for relining. The basic iron situation is being eased somewhat, although indirectly, by resumption of operations at the Chester, Pa., stack, which had been down two months for relining.

Cleveland — Merchant iron sellers are moving their output without difficulty but they are under notably less pressure than was the case some months back. Foundry operations in the district are spotty, some shops reportedly operating at a brisk pace and others less actively. Those producing castings for the automotive and appliance industries are doing better than some others. Foundries on defense work also are busy but the pressure in this area is reportedly off some. With iron supplies adequate buyers are not ordering heavily for inventory. Blowing out of a furnace depended upon for silvery iron has caused some inconvenience to consumers, but it is reported the loss of this tonnage is being overcome by supplies from other producers.

Cincinnati — Pig iron demand is holding up well. Castings for the

(*Turn to page* 191)



Out at Lima-Hamilton Corp., Hamilton, Ohio, they braze five parts of their 9x12 Diesel locomotive engine. Here are the jobs, the time cycles—also test results quoted from their report.

PART AND JOB	TIME CYCLE	TEST RESULTS
Exhaust rocker arm to shaft induction brazed with a ring of 3/32" EASY-FLO wire preplaced.	318 secs. 2 pieces	"On torque loading the 1 ¼" rocker shaft twists at 12,000 lbs. No failure of joint."
Intake rocker arm to shaft done same as above.	282 secs. 2 pieces	Same result as above.
Tappet plugs to tappet body, induction brazed with a ring of 3/32" EASY-FLO wire preplaced.	72 secs. each	"Parent metal fails before brazed joint when attempting to press plug from tappet body."
Ball ends to seamless steel tubing push rods, induction brazed with a ring of 1/16" EASY-FLO No. 3 wire preplaced. (Illustrated above)	45 secs.	"Tube bulges before joint failure when attempting to push rod ends out of tubing."
Cup ends to seamless steel tubing push rods done same as above.	50 secs.	Same result as above.

BULLETIN 20 *gives you the how and why you get stronger joints in faster time at lower cost with EASY-FLO low-temperature silver alloy brazing. Write for your copy today.*

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MONTREAL, CANADA

(Continued from page 185)

Houston,Tex. S5 .....4.125
Ind.Harbor,Ind. I-2,Y1.3.725
Johnstown,Pa.(25) B2..3.725
KansasCity,Mo.(9) S5..4.325
Lackaw'na,N.Y.(32) B2 3.725
LosAngeles(25) B3 ....4.475
Milton,Pa. B6 .....4.35
Minnequa,Colo. C10 ...4.775
NewBritain(10) S15 ...4.225
N.Tonawanda,N.Y. B11 3.725
Pittsburg,Calif. C11 ...4.475
Riverdale,Ill. A1 .....3.725
SanFrancisco S7 .....5.00
Seattle(25) B3 .....4.725
Seattle N14 .....4.75
Sharon,Pa. S3 .....4.225
So.Chicago,Ill. W14 ...3.725
So.SanFrancisco(25) B3 4.475
SparrowsPoint,Md. B2..3.725
Sterling,Ill. N15 .....4.725
Torrance,Calif. C11 ...4.475
Warren,O. R2 .....3.725
Weirton,W.Va. W6 ....3.825
WestLeechburg,Pa. A4..3.975
Youngstown U5, Y1 ...3.725

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15.6.05
Carnegie,Pa. S18 .....6.45
Fontana,Calif. K1 .. ...7.30
Gary,Ind. U5 .....6.10
Houston,Tex. S5 .....6.50
KansasCity,Mo. S5 ....6.70
Midland,Pa. C18 .....5.85
NewBritn.,Conn.(10) S15 6.05
Sharon,Pa. S3 .....6.45
Youngstown U5 .....6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6 ..5.50
Bridgeprt,Conn.(10) S15.5.80
Butler,Pa. A10 .....5.10
Cleveland A7, J5 .....5.10
Dearborn,Mich. D3 .....6.05
Detroit D2 .....5.60
Detroit M1 .....5.45
Dover,O.(40) G6 .....5.50
Ecorse,Mich. G5 .....5.30
Follansbee,W.Va. F4 ...5.10
Fontana,Calif. K1 .....6.75
FranklinPark,Ill.(40)T6 .5.35
Ind.Harbor,Ind. I-2 ....5.35
Lackawanna,N.Y. B2 ...5.10
LosAngeles C1 .....7.15
Mattapan,Mass. T6 ....5.95
Middletown,O. A10 ....5.10
NewBritain(10) S15 ....5.80
NewCastle,Pa. B4 .....5.80
NewCastle,Pa.(40) E5 ..5.70
NewHaven,Conn. D2 ...5.85
NewHaven,Conn. A7 ...5.60
Pawtucket,R.I. R3 .....6.45
Pawtucket,R.I.(21) N8..6.30
Riverdale,Ill.(40) A1 ...5.35
Rome,N.Y. R6 .....5.10
Sharon,Pa. S3 .....5.80
SparrowsPoint,Md. B2 ..5.10
Trenton,N.J. R5 .....6.45
Wallingford,Conn. W2 ..6.30
Warren,O.(40) T5 .....5.70
Warren,O. R2 .....5.10
Weirton,W.Va. W6 .....5.10
Youngstown C8 (40) ...5.70
Youngstown Y1 .....5.10

STRIP, Electro Galvanized

Dover,O. G6 .....5.50
Warren,O. T5 .....5.70
Weirton,W.Va. W6 .....5.10
Youngstown C8 .....5.70

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)S15 12.15
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....11.40
Dover,O. G6 .....11.90
Fontana,Calif. K1 ....13.05
Harrison,N.J. C18 ....12.00
Midland,Pa. C18 .....12.00
NewBritn,Conn.(10)S15 12.15
Pawtucket,R.I.(11) N8..12.15
Pawtucket,R.I.(12) N8.12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ...11.70
Youngstown C8 .....12.00

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ..3.975
Warren,O. R2 .....4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....5.70

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.45
Riverdale,Ill. A1 .....4.30
Sharon,Pa. S3 .....4.55
Youngstown U5 .....4.15

WIRE, Merchant Quality

(6 to 8 gage)	An'ld. Galv.
AlabamaCity R2..6.075	6.325
Aliquippa J5 ...6.075	6.525‡
Atlanta A11 .....6.325	6.675
Bartonville(19)K4 .6.075	6.40
Buffalo W12 ....5.225	....
Cleveland A7 ....6.075	6.225
CrawfordsvilleM8 6.175	6.475
Donora,Pa. A7 ..6.075	6.225
Duluth,Minn. A7. 6.075	6.225
Fairfield T2 .....6.075	6.225
Houston,Tex. S5..6.475	6.80
Johnstown B2 ...6.075	6.45†
Joliet,Ill. A7 ....6.075	6.225
KansasCy,Mo. S5.6.675	7.00
Kokomo C16 ....6.175	6.425
LosAngeles B3 ..7.025	
Minnequa C10 ...6.325	6.70*
Monessen P7 ....6.075	6.45
Palmer W12 .....5.525	
Pitts.,Calif. C11..7.025	7.175
Prtsmth.(18)P12..6.475	
Rankin A7 .....6.075	6.225
So.Chicago R2 ..6.075	6.325
So.S.Fran. C10 ..7.025	7.40*
SparrowsPt, B2 ..6.175	6.55†
Sterling,Ill.(1)N15 6.075	6.375
Struthers,O. Y1 ..6.075	6.475
Torrance,Cal. C11 7.025	
Worcester A7 ...6.375	6.525

*Based on 14c zinc; †14.50c zinc; ‡17.5c zinc.

WIRE (16 gage) — **Anl'd. Galv. Stone** — **Stone**
(Add 4.7% on base and extras)

Aliquippa J5 ....10.15 12.15
Bartonville(19)K4 10.25 12.00*
Cleveland A7 ....10.25 11.55
Crawfrdsville M8.10.73 12.51
Fostoria,O. S1 ..10.40 13.00
Johnstown B2 ...10.73 12.58‡
Kokomo C16.10.625† 12.325‡
Minnequa C10..10.40 12.425*
Palmer,Mass.W12.10.25 12.15
Pitts.,Cal. C11 ..10.60 11.90
SparrowsPt, B2.10.84 12.68‡
Sterling(1) N15 10.73† 12.15†
Waukegan A7 ...10.25 11.55
Worcester A7 .....11.85

*Based on 14c zinc; ‡14.50c zinc. †Includes 4.7% increase.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2..5.225
Aliquippa,Pa. J5 (42)...4.85
Atlanta A11 .....5.475
Alton,Ill. L1 .....5.45
Bartonville,Ill. K4 ....5.325
Buffalo W12 .....5.225
Chicago W13 .....5.475
Cleveland A7, C20.....5.225
Crawfordsville,Ind. M8.5.325
Donora,Pa. A7 .....5.225
Duluth,Minn. A7 .....5.225
Fairfield,Ala. T2 .....5.225
Fostoria,O. (24) S1 ....5.725
Houston S5 .....5.625
Johnstown,Pa. B2 ....5.225
Joliet,Ill. A7 .....5.225
KansasCity,Mo. S5 ....5.825
Kokomo,Ind. C16 .....5.325
LosAngeles B3 .....6.175
Minnequa,Colo. C10 ...5.475
Monessen,Pa. P7 .....5.475
Newark 6-8 ga I-1 ....5.88
No.Tonawanda B11 ....5.225
Palmer,Mass. W12 ....5.525
Pittsburg,Calif. C11 ...6.175
Portsmouth,O. P12 ....5.625
Rankin,Pa. A7 .....5.225
So.Chicago,Ill. R2 ....5.225
So.SanFrancisco C10 ...6.175
SparrowsPoint,Md. B2..5.325
Sterling,Ill. (1) N15 ...5.225
Struthers,O. Y1 .....5.225
Torrance,Calif. C11 ...6.175
Waukegan,Ill. A7 .....5.225
Worcester,Mass. A7 ...5.525

WIRE, Cold-Rolled Flat

Anderson,Ind. G6 .....6.20
Buffalo W12 (43) 6.35
Cleveland A7 (43) 5.85
Crawf'sville,Ind.M8(48) 5.70
Dover,O. G6 .....6.20
Fostoria,O. S1 (43) 6.00
Kokomo,Ind. C16 (43)..5.70
FranklinPark,Ill. T6(43) 6.20
Massillon,O. R8 (43) ...5.85
Monessen,Pa. P16 (43)..6.35
Monessen,Pa. P7 (43) ..6.10
Pawtkt,R.I.(12) N8 (43)6.85
Trenton,N.J. R5 (43) ...6.15
Worcester,Mass. A7 (43).6.15
Worcester,Mass. T6 (43).6.50
Worcester,Mass.W12(43) 6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4 .....8.90
Monessen,Pa. P16 (43)..8.50
Muncie,Ind. I-7 (43) ...8.70
Roebling,N.J. R5 (43) ..8.80
SparrowsPt.,Md. B2(43).8.60
Johnstown,Pa. B2 (43)..8.50

ROPE WIRE

Alton,Ill. L1 (43) 8.75
Bartonville,Ill. K4 .....8.95
Buffalo W12 (43) 8.55
Fostoria,O. S1 (43) 8.85
Johnstown,Pa. B2 (43)..8.55
Monessen,Pa. P16 (43)..8.55
Monessen,Pa. P7 (43) ..8.80
Muncie,Ind. I-7 (43) ...8.75
Palmer,Mass. W12 (43).8.85
Portsmouth,O. P12 (43).8.55
Roebling,N.J. R5 (43) ..8.85
SparrowsPt, B2 (43) ...8.65
Struthers,O. Y1 (43) ...8.55
Worcester J4, T6 (43) ...8.85

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 (43) ..6.25
Alton,Ill. L1 (43) 6.55
Bartonville,Ill. K4 .....6.64
Buffalo W12 (43) 6.25
Cleveland A7 (43) 6.25
Donora,Pa. A7 (43) 6.25
Duluth,Minn. A7 (43) ..6.25
Fostoria,O. S1 (43) 6.25
Johnstown,Pa. B2 (43)..6.25
Millbury(12) N6 (43)...8.05
Minnequa,Colo. C10(43).6.50
Monessen,Pa. P7 (43) ..6.25
Monessen,Pa. P16 .....6.75
Muncie,Ind. I-7 (43) ...6.45
Palmer,Mass. W12(43)..6.55
Pittsburg,Calif. C11(43).7.20
Roebling,N.J. R5 (43)..6.55
Portsmouth,O. P12(43)..6.25
So.Chicago,Ill. R2 (43)..6.25
So.SanFran. C10 (43) ..7.20
SparrowsPt.,Md. B2 (43)6.35
Struthers,O. Y1 (43) ...6.25
Trenton,N.J. A7 (43) ..6.55
Waukegan,Ill. A7 (43)..6.25
Worcester A7, T6 (43)..6.55
Worcester,Mass. W12(43)6.55
Worcester,Mass. J4 (43).6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....6.275
Alton,Ill. L1 .....6.50
Buffalo W12 .....6.275
Cleveland A7 .....6.275
Donora,Pa. A7 .....6.275
Duluth,Minn. A7 .....6.275
Johnstown,Pa. B2 .....6.275
LosAngeles B3 .....7.225
Minnequa,Colo. C10 ...6.525
Monessen,Pa. P7 .....6.275
Monessen,Pa. P16(42) ..6.40
NewHaven,Conn. A7 ..6.575
Palmer,Mass. W12 .....6.575
Pittsburg,Calif. C11 ...7.225
Portsmouth,O. P12 ....6.275
Roebling,N.J. R5 .....6.575
So.Chicago,Ill. R2 ....6.275
So.SanFrancisco C10 ..7.225
SparrowsPoint,Md. B2..6.375
Torrance,Calif. C11 ...7.225
Trenton,N.J. A7 .....6.575
Waukegan,Ill. A7 .....6.275
Worcester,Mass. A7 ...6.575

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1 (43) 9.20
Bartonville,Ill. K4 .....9.42
Buffalo W12 (43) 8.90
Chicago W13 .....9.32
Cleveland A7 (43) 8.90
Crawf'sville,Ind. M8(43) 8.90
Fostoria,O. S1 (43) 8.90
Johnstown,Pa. B2 (43)..8.90
Kokomo,Ind. C16 (43)..8.90
Monessen,Pa. P16 (43)..8.90
Muncie,Ind. I-7 (43) ...9.10
Palmer,Mass. W12 (43).9.20
Roebling,N.J. R5 (43) ..9.20
Waukegan,Ill. A7 (43)..8.90
Worcstr,Mass. A7,T6(43)9.20

WIRE, Tire Bead

Bartonville,Ill. K4 ....11.51
Monessen,Pa. P16 (43)..11.40
Roebling,N.J. R5 (43)..11.55

WOVEN FENCE, 9-15½ Ga. — **Col.**

AlabamaCity,Ala. R2 ...135
Ala.City,Ala.,17-18ga.R2 222
Aliqu'pa,Pa.9-14½ga.J5 139‡
Atlanta A11 140
Bartonville,Ill.(19) K4 ..137
Crawfordsville,Ind. M8 ..138
Donora,Pa. A7 133
Duluth,Minn. A7 133
Fairfield,Ala. T2 133
Houston,Tex. S5 145
Johnstown,Pa. B2 138
Johnstown 17ga.,6" B2 ..229
Joliet,Ill. A7 133
KansasCity,Mo. S5 149
Kokomo,Ind. C16 140
Minnequa,Colo. C10 ....146*
Monessen,Pa. P7 138
Pittsburg,Calif. C11 156
Rankin,Pa. A7 133
So.Chicago,Ill. R2 135
Sterling,Ill. (1) N15.....136

*On 14c zinc; ‡17.5c zinc.

FENCE POSTS — **Col.**

ChicagoHts.,Ill. C2 140
Duluth,Minn. A7 133
Franklin,Pa. F5 145
Huntington,W.Va. W7 ..148
Johnstown,Pa. B2 148
Marion,O. P11 140
Minnequa,Colo. C10 138
Moline,Ill. R2 136
So.Chicago,Ill. R2 140
Tonawanda,N.Y. B12 148
Williamsport,Pa. S19 ...158

WIRE, Barbed — **Col.**

AlabamaCity,Ala. R2 ...144
Aliquippa,Pa. J5 .....148‡
Atlanta A11 149
Bartonville,Ill.(19) K4 ..146
Crawfordsville,Ind. M8 ..147
Donora,Pa. A7 142
Duluth,Minn. A7 142
Fairfield,Ala. T2 142
Houston,Tex. S5 154
Johnstown,Pa. B2 145
Joliet,Ill. A7 142
KansasCity,Mo. S5 158
Kokomo,Ind. C16 149
Minnequa,Colo. C10 ....153*
Monessen,Pa. P7 147
Pittsburg,Calif. C11 162
Rankin,Pa. A7 142
So.Chicago,Ill. R2 144
So.SanFran.,Calif. C10..167*
SparrowsPoint,Md. B2 ..147
Sterling,Ill.(1) N15 145

*Based on 14c zinc; ‡17.5c zinc.

BALE TIES, Single Loop — **Col.**

AlabamaCity,Ala. R2 ...132
Atlanta A11 135
Bartonville,Ill.(19) K4 ..132
Crawfordsville,Ind. M8 ..132
Donora,Pa. A7 132
Duluth,Minn. A7 132
Fairfield,Ala. T2 132
Joliet,Ill. A7 132
KansasCity,Mo. S5 144
Kokomo,Ind. C16 134
Minnequa,Colo. C10 137
Pittsburg,Calif. C11 156
So.Chicago,Ill. R2 132
So.SanFran.,Calif. C10 ..156
SparrowsPoint,Md. B2 ..134
Sterling,Ill.(1) N15 132

TRACK BOLTS (20) Treated

KansasCity,Mo. S5(46)..9.85
Lebanon,Pa. (31) B2 ...9.85
Minnequa,Colo. C10 ....9.85
Pittsburgh O3, P14 ....9.85

AXLES

Ind.Harbor,Ind. S13 ....5.65
Johnstown,Pa. B2 .....5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2 ...127	
Aliquippa,Pa. J5 127	
Atlanta A11 130	
Bartonville,Ill. (19) K4..127	
Chicago,Ill. W13 127	
Cleveland A9 (44) 125	
Crawfordsville,Ind. M8 ..127	
Donora,Pa. A7 127	
Duluth,Minn. A7 127	
Fairfield,Ala. T2 127	
Galveston,Tex. D7 135	
Houston,Tex. S5 135	

RAILS

	Std. No. 1	Std. No. 2	All No. 2	60 lb Under
Bessemer,Pa. U5	3.775	3.675	3.725	4.25
Ensley,Ala. T2	3.775	3.675	....	4.25
Fairfield,Ala. T2	....	....	....	4.25
Gary,Ind. U5	3.775	3.675	3.725	....
Huntington,W.Va. W7	....	....	....	5.25
IndianaHarbor,Ind. I-2	3.775	3.675	3.725	....
Johnstown,Pa. B2	....	....	...(16)	4.25
Lackawanna,N.Y. B2	3.775	3.675	....	4.25
Minnequa,Colo. C10	$75.50*	$73.50*	....	4.75
Steelton,Pa. B2	3.775	3.675	....	....
Williamsport,Pa. S19	....	....	....	5.00

Std. Tee Rails

* Per net ton.

So.Chicago,Ill. R2 127
SparrowsPt.,Md. B2 129
Sterling,Ill.(1) N15 127
Torrance,Calif. C11 147
Worcester,Mass. A7 133

STAPLES, Polished, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2 ...126	
Aliquippa,Pa. J5 126	
Atlanta A11 129	
Bartonville,Ill. (19) K4..126	
Chicago W13 127	
Crawfordsville,Ind. M8 ..128	
Donora,Pa. A7 126	
Duluth,Minn. A7 126	
Fairfield,Ala. T2 126	
Johnstown,Pa. B2 126	
Joliet,Ill. A7 126	
Kokomo,Ind. C16 126	
Minnequa,Colo. C10 (45)..123	
Monessen,Pa. P7 127	
Pittsburg,Calif. C11 145	
Portsmouth,O. P12 132	
Rankin,Pa. A7 126	
So.Chicago,Ill. R2 126	
SparrowsPt.,Md. B2 128	
Sterling,Ill.(1) N15 126	
Torrance,Calif. C11 146	
Worcester,Mass. A7 132	

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3 ..$7.80	
Wheeling,W.Va. W10 ...7.80	

TIE PLATES

Fairfield,Ala. T2 .....4.775
Gary,Ind. U5 .....4.775
Ind.Harbor,Ind. I-2 ....4.775
Lackawanna,N.Y. B2 ..4.775
Minnequa,Colo. C10..$95.50*
Pittsburg,Calif. C11 ...4.925
Seattle B3 .....4.925
Steelton,Pa. B2 .....4.775
Torrance,Calif. C11 ...4.925
* Per net ton.

JOINT BARS

Bessemer,Pa. U5 .....4.925
Fairfield,Ala. T2 .....4.925
Ind.Harbor,Ind. I-2 ....4.925
Joliet,Ill. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Minnequa,Colo. C10 ...4.925
Steelton,Pa. B2 .....4.925

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1.6.65
KansasCity,Mo. S5 .....6.90
Lebanon,Pa. B2 .....6.65
Minnequa,Colo. C10 ....6.65
Pittsburgh J5 .....6.65
Seattle B3 .....7.15
So.Chicago,Ill. R2 .....6.65
Struthers,O. Y1 .....6.65
Youngstown R2 .....6.65

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	
18	4	1	....	1.505
18	4	2	....	1.65-1.66
20.25	4.25	1.6	12.25	3.535-3.675
19	4	2	7	2.460
18.25	4.25	1	4.75	2.125
18	4	2	9	2.445-2.45
13.5	4	3	....	1.6025
9	3.25	0.5	....	1.01

W	Cr	V	Mo	
6.4	4.5	1.9	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

FOOTNOTES

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(15) ⅛" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.05c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Add $31.50 per ton.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.85c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Plus 0.375c per 100 lb.
(43) Plus 4.7% on base and extras.
(44) Plus 45c per 100 lb.
(45) Plus 40c per 100 lb.
(46) Plus 2.2 per cent.

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½		2		2½		3	
List Per Ft.	8.5c		11.5c		17c		23c		27.5c		37c		58.5c		76.5c							
Pounds Per Ft.	0.85		1.13		1.68		2.28		2.73		3.68		5.82		7.62							
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	32.5	15.25	35.5	18.25	38	20.75	38.5	20.5	39	21	39.5	21.5	40	21.25	40	21.25						
Alton, Ill. L1 (†)	29.5	10.5	32.5	14.5	35	18	35.5	18.5	36	19.5	36.5	20	37	20.5	37	20.5						
Benwood, W. Va. W10	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75						
Etna, Pa. N2 (†)	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	22.25	39.5	22	40	21.75	40	21.75						
Fontana, Calif. K1 (†)	19.5	0.25	22.5	4.25	25	7.75	25.5	7.5	26	8.5	26.5	9	27	8.75	27	8.75						
Ind. Harbor, Ind. Y1 (†)	31.5	14.25	34.5	18.25	37	21.75	37.5	21	38	22	38.5	22.25	39	21.75	39	21.75						
Lorain, O. N3 (*)	32.5	22.25	35.5	26.25	38	29.75	38.5	27.25	39	28.25	39.5	28.75	40	26.25	40	26.25						
Sharon, Pa. M6	32.5	14.25	35.5	18.25	38	21.25	38.5	20.50	39	21.00	39.5	21.50	40	20.75	40	20.75						
Sparrows Pt., Md. B2	30.5	11.25	33.5	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75						
Youngstown R2 (**)	32.5	16.25	35.5	20.25	38	23.75	38.5	22.75	39	23.75	39.5	24.25	40	23.25	40	23.25						
Youngstown Y1 (‡)	32.5	15.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75						
Wheatland, Pa. W9	32.5	13.25	35.5	16.25	38	18.75	38.5	19	39	19.5	39.5	20	40	20.25	40	20.25						

SEAMLESS STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft.	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft.	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Ambridge, Pa. N2	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Lorain, O. N3 (*)	24	12.75	27	12.75	27	12.75	29	14.75	29	14.75	33.75	19.5	33.75	19.5
Youngstown Y1 (‡)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown, R2 (**)	24	8.25	27	9.75	27	9.75	29	11.75	29	11.75	33.75	16.5	33.75	16.5

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1	
List Per Ft.	5.5c		6c		6c		92c		$1.09			
Pounds Per Ft.	0.24		0.42		0.57		9.20		10.89			
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv		
Benwood, W. Va. W10	29.5	+0.25	23.25	+3.5	17.75	+7.75	33	14.25	33	14.25		
Butler, Pa. F6 (†)	30.5	1.25	25	+1.75	20	+5.5	..	....	..	....		
Etna, Pa. N2 (†)	30.5	1.25	25	+1.75	20	+5.5	33	14.25	33	14.25		
Sharon, Pa. M6 (‡)	29.5	—1.75	23	+2.25	18	+5.25	..	....	..	....		
Sharon, Pa. S4 (†)	30.5	1.25	25	+1.75	20	+5.5	..	....	..	....		
Sparrows Pt., Md. B2	28.5	+0.75	23	+3.75	18	+7.50	..	....	..	....		
Youngstown R2 (**)	..	....	..	....	..	....	33	15.75	33	15.75		
Wheatland, Pa. W9	28.5	+0.75	23	+3.75	18	+7.50	..	....	..	....		

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 12.50c; (**), 11.50c; (*), 5c, with discounts adjusted depending on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill; minimum wall thickness, cut lengths 10 to 24 ft., inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	14.19	16.71–17.77	16.20	16.20
1¼	13	16.97	19.80–21.26	16.46	19.19
1½	13	18.22–18.77	22.08–22.82	18.19	21.41
1¾	13	20.35–21.35	24.92–25.49	20.69	24.35
2	13	22.81–23.93	27.94–28.58	23.19	27.28
2¼	13	25.69–26.66	31.38–32.18	25.84	30.42
2½	12	28.40–29.36	34.55–35.58	28.46	33.50
2¾	12	31.28–32.17	37.83–39.19	31.19	36.67
3	12	33.87–34.82	40.09–42.44	33.05	38.86
3½	12	35.78–36.87	42.11–44.93	34.98	40.82

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS
(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam. 15
- ⅝-in. & ¾-in. 18.5
- ⅞-in. and larger 17.5

Longer than 6 in.:
- All diams. 14

Lag bolts, all diams.:
- 6 in. and shorter 23
- over 6 in. long 21

Ribbed Necked Carriage 18.5
Blank 34
Polw 34
Step, Elevator, Tap and Sleigh Shoe 21
Tire Bolts 21
Boiler & Fitting-Up Bolts 31

NUTS

	Reg.	Hvy.
H.P. & C.P. Square:		
½-in. & smaller	15	15
⅝-in. & ¾-in.	12	6.5
⅞-in.-1½-in.	9	1
1⅝-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	16.5	6.5
⅞-in.-1½-in.	12	2
1⅝-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	23	17.5
⅞-in. & 1¼-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard (Per cent off list for less than case or keg quantities)	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ¾-in.	29.5	22
⅞-in.-1½-in.	24	15
1⅝-in. & larger	.13	8.5
	Light	
7/16-in. & smaller	35	17.5
½-in. to ⅝-in.	28.5	
¾-in. to 1½-in.	26	

SQUARE HEAD SET SCREWS
(Packaged; per cent off list)

1 in. diam x 6 in. and shorter 38
1 in. and smaller diam. x over 6 in. 26

HEADLESS SET SCREWS
(Packaged; per cent off list)

No. 10 and smaller 35
¼-in. diam. & larger 16
N.F. thread, all diams. 10

STEEL STOVE BOLTS
(F.o.b. plant, per cent off list in packages)

Plain finish .....48 & 10
Plated finishes .....31 & 10

HEXAGON CAP SCREWS
(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ⅝-in. & smaller 42
- ¾-in. through 1 in. 34

Longer than 6 in.:
- ⅝-in. and smaller 26
- ¾-in. through 1 in. 4

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.85c
7/16-in. under .....36 off

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Inches Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
	CARBON	
35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron: Cents
- 98+% Fe, annealed 18.00
- Unannealed 14.50
- Swedish, c.l.f. N.Y., c.l., in bags 10.90

Electrolytic iron:
- Annealed, 99.5% Fe. 42.50
- Unannealed (99+% Fe) 36.50
- Unannealed (99+% Fe) (minus 325 mesh) 53.50

Powder Flakes 48.50

Carbonyl Iron:
- 97.9-99.8% size 5 to 10 microns .83.00-148.00

Aluminum:
- Carlots, freight allowed 31.00
- Atomized, 500 lb drums, freight allowed 33.00

Antimony, 500 lb lots. 71.00
Brass, 20-ton lots.31.00-34.25
Bronze, 10-ton lots 51.25-60.00
Phosphor-Copper, 20-ton lots 50.00
Copper:
- Electrolytic 37.25
- Reduced 35.25

Lead 7.50*
Magnesium 75.00-85.00
Manganese:
- Minus 100 mesh 57.00
- Minus 35 mesh 52.00
- Minus 200 mesh 62.00

Nickel unannealed 86.00
Nickel-Silver 5-ton lots 46.00
Silicon 38.50
Solder 8.50*
Stainless Steel, 302 ..83.00
Zinc, 10-ton lots.18.00-31.00

Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	5.85
Less than 1000 lb	6.00
Molybdenum: 99.9%, minus 200 mesh	3.24
Chromium, electrolytic 99.9% Cr min.	3.50

* Plus cost of metal.

STAINLESS STEEL

(Add 4.7% to extras where new extra cards have not been issued)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	44.25	36.50	33.75
302	44.50	39.75	34.00
303	46.50	43.50	36.50
304	46.50	41.75	35.50
309	60.50	59.25	48.25
316	61.50	63.50	53.00
321	53.00	52.00	40.00
347	58.00	56.50	44.75
410	39.00	32.75	27.50
416	40.00	40.00	28.00
420	47.00	50.25	33.50
430	41.50	33.25	28.00
501	29.25	27.75	15.25

Balt., Types 301-347 and 430 sheets, except 303 and 309 E2.
Brackenridge, Pa. sheets A4 quotes slight variations on Types 301-347.
Bridgeville, Pa., bars, wire, sheets & strip U4
Butler, Pa. sheets and strip except Types 303, 309, 416 420, 501 & 502, A10.
Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.
Cleveland, strip A7.
Detroit, strip M1 quotes 34.00c on Type 301; 36.50c 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.
Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.
Duquesne, Pa., bars U5.
Fort Wayne, Ind., bars and wire, except 501 & 502 J6 quotes slight variations on Types 301-347.
Gary, Ind., sheets except Type 416 U5.
Harrison, N. J., strip and wire C18.
Harrison, N. J., wire, Type 302, 33.00c; Type 304, 34.50c; Type 316, 51.50c, including 4.7% increase.
Massillon, O., all items, R2.
McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 221, 41.25c on 347 F2.
McKeesport, Pa., bars, sheets except Type 416 U5.
Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.
Midland, sheets & strip C18.
Munhall, Pa., bars U5
Muncie, Ind., wire 1-7 quotes types 302, 304, 430.
Pittsburgh, sheets C18.
Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.
Sharon, Pa., strip except Types 303, 309, 416, 501 502 and 34.25c on Type 301 S3.
So. Chicago, bars, shapes U5.
Syracuse, N. Y., bars, wire & structurals C18.
Titusville, Pa., bars U4.
Wallingford, Conn., strip W2 quotes 0.25c higher.
Washington, Pa., bars, sheets & strip J3.
Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.
Watervliet, N. Y., structurals & bars A4.
Waukegan, bars & wire A7.
West Leechburg, strip A4.
Youngstown, strip C8.

CLAD STEELS

(Cents per pound; add 4.7% to base price and extras)

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Copper Base Both Sides
302	....	....	19.75	26.24-27.50	77.00
304	25.00	29.50	24.50	27.50-27.77	77.00
309	30.50	35.00	....	....	....
310	36.50	41.00	....	....	144.00
316	29.50	34.00	26.00	35.92-36.50	....
317	34.50	39.00	....	....	....
318	33.50	38.00	....	....	....
321	26.50	31.00-32.00	23.00	33.00	111.00
347	27.50	32.00	24.00	33.50-33.83	130.00
405	21.25	27.75	....	....	....
410	20.75	27.25	....	....	....
Nickel	33.55	45.15	....	....	....
Inconel	41.23	54.18	....	....	165.00
Monel	34.93	46.28	....	....	....
Copper*	....	....	....	44.00	....

Cladding Stainless	Strip Carbon Base Cold-Rolled 10%	Strip Carbon Base Cold-Rolled Both Sides	Strip Carbon Base Hot-Rolled 10%	Strip Carbon Base Hot-Rolled Both Sides
Nickel	41.00	54.00	....	....
Copper*	23.70	26.65	20.20	26.40

* Deoxidized. Production points: Stainless plates, sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, arnegie, Pa. S18; Production point for copper-base sheets is Carnegie, Pa. A13.

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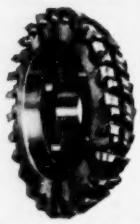
APEX TOOL BITS FIT MOST STANDARD HOLDERS

If you haven't yet changed to Apex, you can begin to get acquainted by using Apex Bits in your present holders. The Apex line includes Single-Point Round Shank (as shown) and Shankless Serrated — plus Inserted-Blade Milling Cutters of all different styles. Write for catalog.



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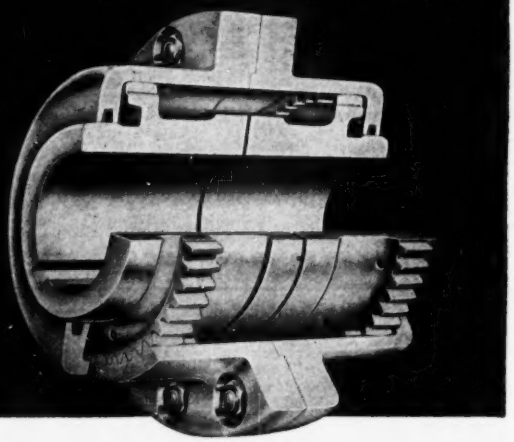

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IF IT'S *RIVETED* YOU *KNOW* IT'S SAFE

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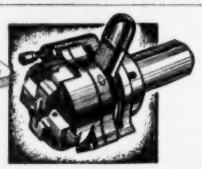

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THE COLOR TELLS THE THICKNESS

ALWAYS RETAINS UNIFORMITY AND EVENNESS UNDER ALL NORMAL CONDITIONS

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TO YOUR REQUIREMENTS
FOR
ALL INDUSTRIAL USES
ARCHITECTURAL GRILLES
SEND FOR CATALOG NO. 35
DIAMOND MFG. CO.
BOX 32 WYOMING, PA.

Pig Iron . . .

(*Continued from page* 187)

automotive industry are a big item with the appliance business offering the next largest demand. The supply of merchant pig iron seems adequate for the demand.

Chicago — Strong production of automobiles, household appliances and farm equipment is now being projected into third quarter and this is improving the outlook for castings requirements. There is enough pig iron available for present consuming needs although sellers are still resorting to customer quotas.

St. Louis—The two blast furnaces here will go 100 per cent on basic iron output next week. One was on foundry iron for a month. Basic demand remains steady, with the probability March shipments will approach a record.

Birmingham — Merchant iron is much more available, on the whole, than it has been for several months. Some sources here and there are getting moderate tonnage now that was not available a few months ago, although there is no considerable tonnage floating around. Merchant iron melters anticipate further gains in supply.

Scrap . . .

Scrap Prices, Page 192

Buffalo—Price declines of $2 per ton were posted on No. 2 bundles and blast furnace grades of scrap here. New orders at lower prices were reported by two top mill consumers. Prices on No. 2 bundles dropped to $41.50 while borings and turnings sold at $35.50. Machine shop turnings, which were not included in new business, fell to $32.50.

While mill reserve stocks have been cut recently, early opening of navigation on the lakes and expectations of heavy shipments of scrap both by lake and canal have added to bearish market sentiment.

Boston—Steel scrap is inclined toward a weaker trend, notably in the secondary grades with borings and turnings. New buying is light. Some tonnage is going to eastern Pennsylvania. Freight charges are operating against higher prices. Cast grades are weak and moving sluggishly. District yards are more reluctant to build up additional cast stocks.

New York—Easier tone is reflected in a general reduction in steel scrap prices. Brokers now are offering $37 for No. 1 heavy melting steel, $34 for No. 2 heavy melting, $24 for machine shop turnings, $27 to $28 for mixed borings and turnings, $40 to $40.50 for low phos and $27 to $28 for shovel turnings. Also, they have reduced offering prices for No. 1 cupola cast to $39 to $40. The leading eastern Pennsylvania consumer of steel scrap now is releasing shipments on a restricted basis.

Philadelphia—Scrap is in good supply with prices easier. No. 1 heavy melting is now $44 to $45, delivered; No. 2 heavy melting $40 to $41; No. 1 bundles $45; No. 2 bundles $38 to $39; and No. 1 busheling $44 to $45. Machine shop turnings have dropped to $31.50 to $32 delivered; mixed borings and turnings $35.50 to $36.50 and heavy turnings $42.50 to $43.50.

Recent high prices for low phos have brought out considerable tonnage with the result prices eased to $47.50 to $48.50 delivered on structurals and plate. Couplers, springs and wheels prices are unchanged at $52.

While cupola and charging box cast are unchanged, heavy breakable is lower at $45 to $46 delivered, unstripped motor blocks at $33 to $34, and drop broken machinery at $40 to $50.

Cleveland—Noticeably easier tone prevails in the scrap market here but with representative sales absent prices are holding unchanged for the moment. Expectations in the trade are that when buying is resumed the steel grades will move at $1 to $2 under the present quoted market. Some traders say they will not be surprised if No. 1 heavy melting drops $2 per ton to a range of $42.50 to $43. In such event other steel grades will go down correspondingly. This, of course, is trade speculation and there is no way of determining the course of prices until the mills actually buy a representative tonnage. The cast grades are unchanged but are moving sluggishly despite the fact foundry operations of late have shown some improvement.

Detroit—Turnings are beginning to weaken in the Detroit market as blast furnaces find their needs filled by industrial scrap of their own customers. Indications are that the price may slide somewhat within the near future as turnings orders vanish in the area and scrap must be shipped out of town for sale. Anticipated softening in No. 2 grades of heavy melting and bundles materialized this week but demand and activity in other grades remain good.

Youngstown—With stocks substantial, some of the district mills are virtually out of the scrap market. They are carefully watching trends, however, to determine which way to jump on inventories.

Cincinnati—The market continues weak with very heavy shipments. A considerable amount of scrap has been purchased for April with one large user buying on a delivered price basis.

No. 2 bundles are selling about $2 under the old ceiling price. At this level there seems to be a great deal of interest.

There has been little or no change in the rail and cast iron market.

No. 1 heavy melting is being traded for the first time in recent years. There is a price differential again being quoted in favor of No. 1.

Chicago—In the face of substantial scrap inventories at the mills and light buying, little price pressure, either up or down, is observed in the market. The melting rate continues high with steelmaking at an all-time record pace, but good stocks and spring weather, which guarantees an uninterrupted flow of tonnage, make for stability in the market. Blast furnace demand lags and the foundries are irregular buyers. Fancy prices paid the railroads for some of their offerings are heard.

St. Louis—Scrap shipments are beginning to taper under lagging mill orders, having been ample to fill outstanding commitments. Mills stocks are up to 90 days and they will not rush to market until price trends are better defined. Few new placements are due before the second week in April. Greatest down pressure is on No. 2 bundles, although they are still at ceiling. Rail prices are firm under strong demand. Offerings continue light. Cast market remains virtually dead with no pickup in sight.

Birmingham—A weakening trend is noted in the scrap market with prices tending downward in most instances. Demand for No. 1 heavy melting is slow with No. 2 in somewhat better position. Most cast grades are moving in small volume with buying selective.

San Francisco—Dullness pervades

(*Turn to page* 194)

The world's best . . . one-piece, drop forged—not welded—of mild carbon steel, heat-treated, with head accurately milled for standard tables on lathes, planers, boring mills, milling machines. Integral washer and nut. Sizes: up to 30". Typical direct prices for 10" lengths: ½—$1.36; ⅝—$1.36; ¾—$1.58; ⅞—$1.89. Write for price list.

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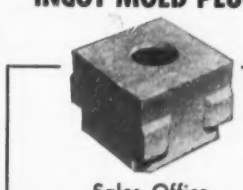

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IRON AND STEEL SCRAP

Open market prices as reported to STEEL, Apr. 2, 1953; gross tons, except as noted. Changes shown in Italics.

STEELMAKING SCRAP COMPOSITE

Apr. 2	$43.75
Mar. 26	44.17
Mar. av.	44.13
Apr., 1952	43.00
Apr., 1948	40.41

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Including brokers' Commission)

No. 1 heavy melting	44.00*
No. 2 heavy melting	42.00*
No. 1 bundles	44.00*
No. 2 bundles	40.00*
No. 1 busheling	44.00*
Machine shop turnings	30.00-31.00*
Mixed borings, turnings	32.00-33.00*
Short shovel turnings	35.00-36.00*
Cast iron borings	*34.00-35.00**
Cut structurals	50.00-51.00*
Heavy turnings	44.00*
Punchings & plate scrap	50.00-51.00*
Electric furnace bundles	46.00*
Cast Iron Grades	
(Delivered)	
No. 1 cupola	47.00-48.00
Charging box cast	*44.00-45.00*
Heavy breakable cast	*43.00-44.00*
Unstripped motor blocks	*40.00-41.00*
No. 1 machinery cast	51.00-52.00
Railroad Scrap	
No. 1 R.R. heavyy melt	*47.00-48.00*
Rails, 2-ft. and under	*57.00-58.00*
Rails, 18-in. and under	*58.00-59.00*
Rails, random lengths	53.00-54.00
Railroad specialties	55.50-56.50

*Plus applicable freight springboards from other areas.

CLEVELAND

(Delivered consumer plant; including broker's commission)

No. 1 heavy melting	44.00-44.50*
No. 2 heavy melting	42.00-42.50*
No. 1 bundles	44.00-44.50*
No. 2 bundles	40.00-40.50*
No. 1 busheling	44.00-44.50*
Machine shop turnings	30.00-31.00*
Mixed borings, turnings	33.00-34.00*
Short shovel turnings	33.00-34.00*
Cast iron borings	33.00-34.00*
Low phos.	49.00-50.00*
Alloy free, short shovel turnings	37.00-38.00*
Electric furnace bundles	46.00-46.50*
Cast Iron Grades	
No. 1 cupola	47.00-48.00
Charging box cast	46.00-47.00
Stove plate	45.00-46.00
Heavy breakable cast	44.00-45.00
Unstripped motor blocks	38.00-38.50
Brake shoes	40.00-41.00
Clean auto cast	52.00
No. 1 wheels	46.00-47.00
Burnt cast	40.00-41.00
Drop broken machinery	49.00
Railroad Scrap	
No. 1 R.R. heavy melt	46.00-47.00
R. R. Malleable	50.00-51.00
Rails, 3-ft. and under	58.00-60.00
Rails, 18-in. and under	61.00-62.00
Rails, random lengths	56.00
Cast steel	51.00-52.00
Railroad specialties	51.00-52.00
Uncut tires	52.00-53.00
Angles, splice bars	54.00-55.00
Rails, rerolling	56.00

*Plus applicable freight springboards from other areas.

YOUNGSTOWN

(Delivered consumer plant; including broker's commission)

No. 1 heavy melting	44.00-44.50*
No. 2 heavy melting	41.50-42.00*
No. 1 bundles	45.00-45.50*
No. 2 bundles	39.50-40.00*
Machine shop turnings	31.00-32.00*
Short shovel turnings	32.00-33.00*
Cast iron borings	32.00-33.00*
Low phos.	50.00-51.00*
Electric furnace bundles	47.00-47.50*
Railroad Scrap	
No. 1 R.R. heavy melt.	46.00-47.00

*Plus applicable freight springboards from other districts.

NEW YORK

(Brokers' Buying Prices)

No. 1 heavy melting	*37.00*
No. 2 heavy melting	*34.00*
Machine shop turnings	*24.00*
Mixed borings, short turnings	*27.00-28.00*
Low phos. (structural & plate)	*40.00-40.50*
Shovel turnings	*27.00-28.00*
Cast Iron Grades	
No. 1 cupola	*39.00-40.00*
Unstripped motor blocks	32.00-33.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	*44.00-45.00*
No. 2 heavy melting	*40.00-41.00*
No. 1 bundles	*45.00*
No. 2 bundles	*38.00-39.00*
No. 1 busheling	*44.00-45.00*
Machine shop turnings	*31.50-32.00*
Mixed borings, turnings	*35.50-36.50*
Short shovel turnings	36.50-37.50
Structurals & Plate	*47.50-48.50*
Heavy turnings	*42.50-43.50*
Couplers, springs, wheels	52.00
Cast Iron Grades	
No. 1 cupola	43.00-44.00
Charging box cast	45.00
Heavy breakable cast	*45.00-46.00*
Unstripped motor blocks	*33.00-34.00*
Drop broken machinery	*40.00-50.00*

CINCINNATI

(Delivered)

No. 1 heavy melting	*45.50*
No. 2 heavy melting	*42.00*
No. 1 bundles	*45.50*
No. 2 bundles	*40.00*
No. 1 busheling	*45.50*
Machine shop turnings	*32.00*
Mixed borings, turnings	*31.00**
Short shovel turnings	*33.00*
Cast iron borings	*31.00**
Structural & plate, 3 ft.	*47.00*
Cast Iron Grades	
No. 1 cupola	45.00
Charging box cast	*40.00*
Stove plate	*36.00**
Burnt cast	*36.00**
Heavy breakable cast	*38.00*
Unstripped motor blocks	*34.00*
Brake shoes	*37.00**
Clean auto cast	43.00
Drop broken machinery	*49.00*
Railroad Scrap	
(Delivered)	
No. 1 R.R. heavy melt.	46.00-47.00
Malleable	49.00-50.00
Rails, 18-in. and under	59.00-60.00
Rails, random lengths	50.00
Rails, rerolling	52.00

*F.o.b. shipping point.

DETROIT

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	*37.50-38.00*
No. 1 bundles	40.00-41.00
No. 2 bundles	*34.50-35.00*
No. 1 busheling	40.00-41.00
Machine shop turnings	24.50-25.00
Mixed borings, turnings	27.00-27.75
Short shovel turnings	27.00-27.75
Punchings & plate scrap	44.00-46.00
Cast Iron Grades	
No. 1 cupola	47.50
Charging box cast	40.00-42.00
Stove plate	43.00-44.00
Unstripped motor blocks	33.00
Clean auto cast	50.00
Malleable	48.00

BUFFALO

No. 1 heavy melting	$46.50-47.50
No. 2 heavy melting	42.00-43.00
No. 2 bundles	*41.50*
No. 1 bundles	43.00-44.00
No. 1 busheling	43.00-44.00
Machine shop turnings	*32.00-32.50*
Mixed borings, turnings	*36.00-36.50*
Short shovel turnings	36.50-37.00
Low phos.	48.50-49.00
Cast Iron Grades	
(F.o.b. Shipping Point)	
No. 1 cupola	42.50-43.00
Drop broken machinery	45.50-46.00

BOSTON

(Brokers' Buying Prices; f.o.b. shipping points)

No. 1 heavy melting	34.17
No. 2 heavy melting	31.17
No. 1 bundles	34.17
No. 2 bundles	31.17
Machine shop turnings	22.17-23.17
Mixed borings, turnings	22.17
Short shovel turnings	26.17-27.17
No. 1 cast	34.00-35.00
Mixed cupola cast	32.00-33.00
No. 1 machinery cast	46.00-47.00

CHICAGO

(Including broker's commission)

No. 1 heavy melting	*42.50-43.00*
No. 2 heavy melting	*41.00-43.00**
No. 1 bundles	*43.50-44.00**
No. 2 bundles	*38.50-39.00**
No. 1 busheling	*43.50-44.00**
Machine shop turnings	27.00-28.00*
Mixed borings, turnings	27.00-28.00*
Short shovel turnings	29.00-30.00*
Cast iron borings	27.00-28.00*
Cut structurals	*47.00-48.00**
Heavy turnings	*41.50-42.00**
Electric furnace bundles	*45.50-46.00**
Cast Iron Grades	
No. 1 cupola	43.00-45.00
Stove plate	39.00-41.00
Unstripped motor blocks	38.00-40.00
Clean auto cast	48.00-50.00
Drop broken machinery	46.00-48.00
Railroad Scrap	
No. 1 R.R. heavy melt.	46.00-48.00
R.R. Malleable	*48.00-50.00*
Rails, 2-ft. and under	*55.00-57.00*
Rails, 18-in. and under	*57.00-59.00*
Angles, splice bars	52.00-54.00
Rails, rerolling	55.00-57.00

*Plus applicable freight springboards from other areas.

BIRMINGHAM

No. 1 heavy melting	*37.00-38.00*
No. 2 heavy melting	*36.00-37.00*
No. 1 bundles	*37.00-38.00*
No. 2 bundles	*34.00-35.00*
No. 2 busheling	*35.00-36.00*
Machine shop turnings	*26.00-27.00*
Mixed borings, turnings	*31.00-32.00*
Short shovel turnings	*30.00-31.00*
Cast iron borings	*30.00-31.00*
Cut structurals	*41.00-42.50*
Heavy turnings	38.00
Punchings & plate scrap	*41.00-41.50*
Electric furnace bundles	*39.00-40.00*
Cast Iron Grades	
(F.o.b. Shipping Point)	
No. 1 cupola	*42.00-43.00*
Charging box cast	*35.00-36.00*
Stove plate	*38.00-39.00*
Heavy breakable cast	*35.00-36.00*
Unstripped motor blocks	*35.00-36.00*
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	*46.00-47.00*
Burnt cast	41.00
Drop broken machinery	42.00-43.00
Railroad Scrap	
No. 1 R.R. heavy melt.	*38.00-39.00*
Malleable	*nom.*
Rails, 2-ft. and under	*46.00-47.00*
Rails, 18-in. and under	49.00
Rails, random lengths	*40.00-41.00*
Cast steel	44.00
Uncut tires	43.00
Angles, splice bars	*44.00-45.00*
Rails, rerolling	*46.00-47.00*

ST. LOUIS

(Brokers' Buying Prices)

No. 1 heavy melting	40.00
No. 2 heavy melting	40.00
No. 1 bundles	*41.00*
No. 2 bundles	*37.00-38.00*
Machine shop turnings	28.50
Short shovel turnings	31.00
Cast Iron Grades	
No. 1 cupola	43.00-45.00
Charging box cast	39.00-41.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	33.00-35.00
Brake shoes	41.00
Clean auto cast	46.00-47.00
Burnt cast	37.00-39.00
Railroad Scrap	
Malleable	40.00
Rails, 18-inch and under	60.00-62.00
Rails, random lengths	50.00-52.00
Uncut tires	46.00-48.00
Angles, splice bars	48.90-49.00
Rails, rerolling	50.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Short shovel turnings	15.00
Electric furnace, No. 1	40.00-41.00
Cast Iron Grades	
(F.o.b. Shipping Point)	
No. 1 cupola	40.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	28.41
No. 1 wheels	47.00
Railroad Scrap	
Rails, random lengths	38.41

SAN FRANCISCO

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
No. 1 busheling	30.00
Machine shop turnings	12.00
Mixed borings, turnings	29.00
Short shovel turnings	29.00
Cast iron borings	29.00
Cut structurals	38.00
Heavy turnings	34.00
Punchings & plate scrap	37.50
Electric furnace bundles	37.00
Cast Iron Grades	
No. 1 cupola	37.50
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor blocks	41.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	47.00
Burnt cast	41.00
Drop broken machinery	52.00
Railroad Scrap	
No. 1 R.R. heavy melt.	37.00
Malleable	55.00
Rails, 3-ft. and under	42.00
Rails, 18-in. and under	45.00
Rails, random lengths	39.00
Cast steel	40.00
Uncut tires	39.00
Angles, splice bars	42.00
Rails, rerolling	44.00

LOS ANGELES

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
Machine shop turnings	12.00
Cast Iron Grades	
(F.o.b Shipping Point)	
No. 1 cupola	38.00-41.00

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.50
Mechanical Bundles	31.50
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	28.50
Rails, Remelting	35.50
Rails, Rerolling	38.50
Busheling	28.00
Busheling new factory:	
Prep'd	33.50
Unprep'd	31.50
Short Steel Turnings	28.50
Cast Iron Grades†	
No. 1 Machinery Cast	50.00

† F.o.b., shipping point.

OLD CEILING BASE PRICES

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Grade 1 / Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	**43.00**	**45.00**
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00

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Where space is limited, plants and mills can conserve floor space and piping, and at the same time handle high tonnages at low operating cost with a Logemann Scrap Press.

Both two and three ram models are available with automatic controls and are recommended when the nature of the scrap warrants such application and where high output is desired.

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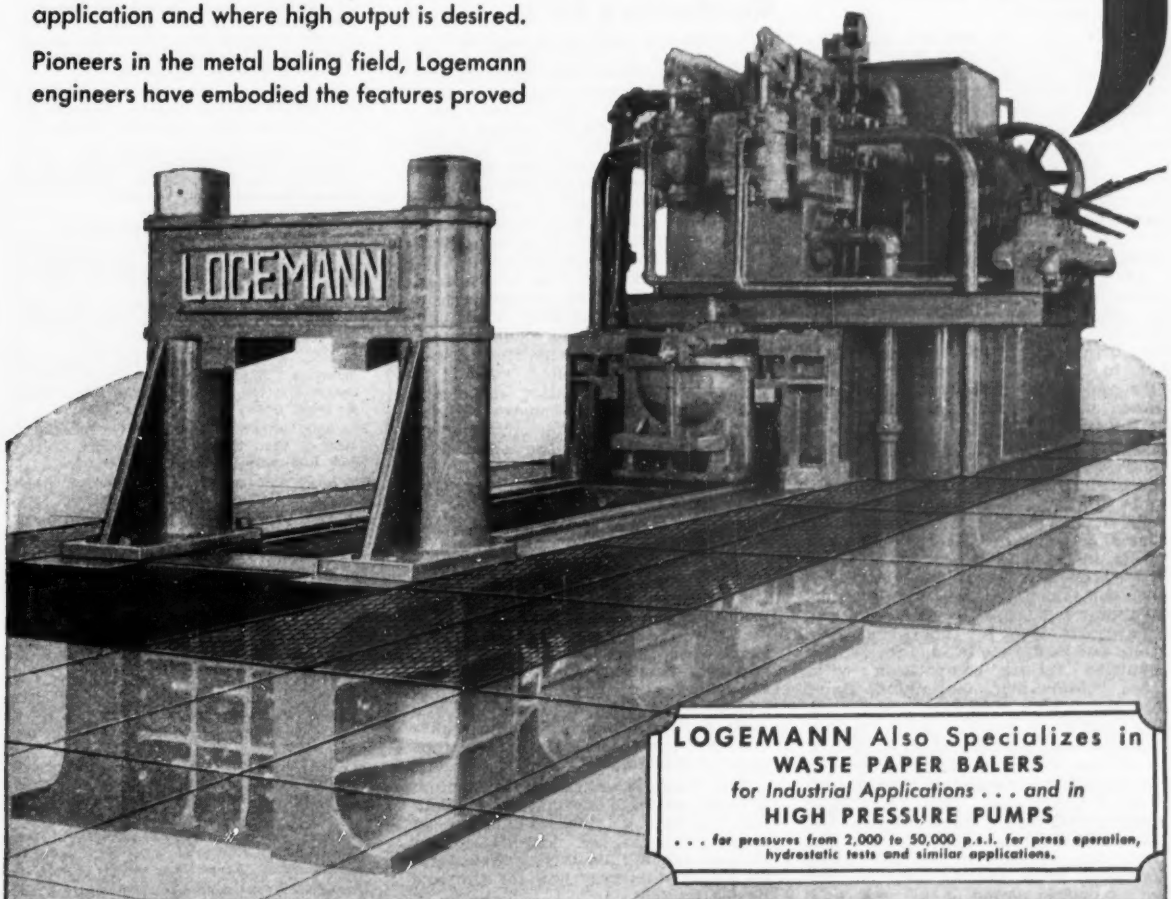

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Scrap . . .

(*Continued from page* 191)

the foundries and demand for cast scrap is extremely light. Steel scrap is in as strong demand as ever, but deliveries are slow. However, inventories are comfortable.

Seattle — Recent price reductions have slowed scrap receipts as shippers react in the hope better prices will eventuate. However, inventories are comfortable and incoming tonnages are sufficient to cover current requirements. Local areas are supplying tidewater mills, shipments from remote points having to absorb freight. Cast iron scrap is in plentiful supply and some of the larger buyers have withdrawn from the market.

Structural Shapes . . .

Structural Shape Prices, Page 184

Philadelphia — Local structural steel demand continues spotty with smaller fabricators competing sharply for such work as they can handle. In fact, they are going after larger projects than they normally would attempt to figure.

Absent from the market is Pennsylvania state highway work pending action by the state legislature providing funds for additional construction. Actually, no bridge work for the Pennsylvania Department of Highways has been placed or inquired for so far this year. Nor has much been placed by the New Jersey State Department of Highways although some fair tonnage has been awarded this year by the New Jersey State Bridge Authority.

At least one large European exporter of steel has increased prices on structural shapes and deformed bars $3, and commercial bars $2 per ton, bringing offerings up to about $10 to $12 above domestic levels. Stronger situation abroad plus continued active outlook here is said to be the reason.

Boston—Structural fabricating shops are more successful in obtaining fill-in sizes, either from premium mills, foreign steel or warehouses. Help from the latter, however, is spotty as secondary stocks of structurals in a wide range of sizes is limited. Contracts for fabricated steel are more competitive, notably for medium-sized tonnages as bridge estimates are down for this period. Average per pound quotations for school tonnages reflect competition with more volume being estimated. Bangor, Me., bridge, 1000 tons, is expected out shortly.

New York—Structural steel awards in February totaled 182,184 tons, according to the American Institute of Steel Construction. This represents a drop from the revised January total of 271,077 tons. The total for the first two months of 452,261 tons, compared with 443,942 tons in the corresponding period of last year and 314,162 tons average for the same period in years 1947-1950, inclusive.

Shipments of 237,499 tons in February were down slightly from the revised figure for January of 239,892 tons. The total of 477,391 tons compared with 491,345 in the corresponding period of last year, and 328,080 ton average for the first two months of 1947-1950, inclusive.

Backlogs Mar. 1 amounted to 2,128,328 tons, against 2,408,032 tons in the like period of 1952.

Pittsburgh—Structural steel supply continues out of balance with demand. Strong order books seem evident into third quarter, as there is no easing in consuming pressure yet in evidence. One sign of a possible softening is the fact that no appreciable increase in tonnage inquiries is reported.

San Francisco — Structural fabricating activity may be given a boost in the next few months through subcontracting from the prime contractor of the structural work for the newly projected Richmond-San Rafael bridge.

Seattle—Fabricators are awaiting award of several large contracts, particularly military installations in Alaska. Estimators are busy, already many bids in abeyance awaiting official clearance. General contract has been placed for the Washington state Chehalis river bridge which will involve 2400 tons shapes, sub contract pending.

Reinforcing Bars . . .

Reinforcing Shape Prices, Page 184

Cleveland—Seasonal upswing in demand for reinforcing and other construction steel is in evidence. Public work is prominent. Chief interest in the market at the moment centers on requirements for the Ohio turnpike. Substantial tonnages of reinforcing bars and mesh already have been placed but more remain to be awarded. Currently, something of a hassle has developed in the placing of turnpike steel as a result of charges of favoritism toward certain suppliers. Specifications, it is alleged, were such as to exclude some suppliers from participating in the business. The argument extends to fights between competing materials, such as asphalt and concrete. Last week rumors were circulating throughout Ohio to the effect the program will be delayed, the target date for completion being moved to June 1, 1954.

Boston — Cement inventories are down for this season and unless corrected, could delay some reinforced concrete steel construction later. Among steel building materials, reinforcing bars are most active, notably for housing projects; 7500 tons have been placed for multiple housing. Bridge and highway requirements are slow. Supply of bars with distributors and fabricators has improved with backlogs heavier. Piling deliveries are less extended and more tonnage is available.

Los Angeles—Higher construction activity sustains a vigorous demand for reinforcing steel. Valuation of construction in Los Angeles county totaled $95 million during February, 20 per cent larger than for the like period in 1952.

Seattle—Rolling mills report booking a fair volume of small tonnages and a sizeable potential of larger contracts is expected to be placed shortly. Numerous major projects are still pending. Meanwhile mills are reducing backlogs. Prospects are promising.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

800 tons, factory building, Heilig Bros. Inc., York, Pa., to Reading Metalcraft Co., Reading, Pa.

400 tons, bleachery superstructure, Oxford Paper Co., Rumford, Me., to Bancroft & Martin Rolling Mills Co., South Portland, Me.; F. W. Cunningham & Sons, Portland, general contractor.

250 tons, high school, Norfolk, Va., to Liphart Steel Co., Richmond, Va.; Virginia Engineering Co. Inc., Newport News, Va., general contractor.

200 tons, mill building, Seidelhuber Steel Rolling Mill, Seattle, to Leckenby Structural Steel Co., Seattle.

175 tons, miscellaneous industrial structures and boiler house at Elmendorf Air Field, Alaska, to Leckenby Structural Steel Co., Seattle.

170 tons, Reading railroad bridge, Montgomery county, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, lintels, Bromley Park housing project, Boston, to Grossman Steel Stair Co., New York; M. S. Kelliher Co., Boston, general contractor; joists to Fabricated Steel Co., Quincy, Mass.

100 tons, municipal garage, Somerville, Mass., to West End Iron Works, Cambridge, Mass.; S. & A. Allen Construction Co., Boston, general contractor.

100 tons or more, boiler plant, Robert Gair Co., Haverhill, Mass., to Groisser & Shlager Iron Works, Somerville, Mass.; by owner, Thomas O'Connor Co., Cambridge, general contractor, reinforcing bars to Joseph T. Ryerson & Son Inc., Cambridge.

Unstated, seven prefabricated steel buildings for various industrial firms in Pacific Northwest, to Leckenby Structural Steel Co., Seattle.

Unstated, insulator pedestal, to King Bros., Portland, Oreg., low $28,125, by Bonneville Power Administration, Portland.

STRUCTURAL STEEL PENDING

2400 tons, Washington state Chehalis river bascule span; general contract to MacRae Bros., Seattle, low $3,364,025.

1250 tons, bridges, Fulton county, Ohio; bids Apr. 8, Ohio Turnpike Commission, Columbus, contracts C-56 and C-57.

725 tons, structural shapes and piling, substructure, Sakonnet river bridge, Portsmouth-Tiverton, R. I., Whaling City Dredge & Dock Corp., Groton, Conn., low.

700 tons, bridges, Fulton county, Ohio; bids Apr. 8, Ohio Turnpike Commission, Columbus; contracts C-54 and C-55.

575 tons, Washington state Skagit river swing bridge; bids to Olympia, Apr. 14.

415 tons, Bureau of Public Roads bridge, Mt. Hood forest area, Clackamas county, Oreg.; bids to Portland Apr. 9.

310 tons, foundry and machine shop, Red Lyon plant, Budd Co., Philadelphia & Robinson Steel Co., Philadelphia, low.

250 tons, intake gates, machinery, etc., Chief Joseph dam; Willamette Iron & Steel Co., Portland, low $218,428, to U. S. engineer, Seattle.

135 tons, three-span WF beam bridge and one span WF beam bridge, Warren, Vt.; bids Apr. 17, Montpelier; also 85 tons reinforcing bars.

125 tons, organization maintenance shop, Ladd Field, Alaska; general contract to Grove, Shepherd, Wilson & Kruge, Seattle, low $1,018,361.

Unstated, prefabricated steel warehouse, steel government furnished; bids to Bureau of Reclamation, Kennewick, Wash., Apr. 21.

Unstated, four schedules, bulkhead gates, guides, frames, etc., Palisades power plant, Idaho; bids to Denver Apr. 23.

Unstated, base maintenance shop, McChord Air Field, Washington; John H. Sellen Const. Co., Seattle, low $320,313.

Unstated, four steel frame buildings, $350,000 tank testing station; bids to Boeing Airplane Co., Seattle, mid-April.

(*Turn to page* 196)

RAILROAD EQUIPMENT—*FOR SALE*

USED **AS IS** **RECONDITIONED**

STANDARD GAUGE FREIGHT CARS

Box, Steel Sheathed, 40-Ton Capacity
Box, Double Sheathed, 50-Ton Capacity
Box, Single Sheathed, 50-Ton Capacity
Flat, 50-Ton, Steel Underframe, 40'6" Long
Gondolas, Composite, or All Steel 50-Ton and 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled

Hoppers, All-Steel, 70-ton, Triple Hopper Cross Dump

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

STANDARD GAUGE AIR DUMP CARS

Side Dump, 20-Yd., 40-Ton, Lift Door
End Dump, 20-Yd., 50-Ton, Drop Door
Side Dump, 30-YD., 50-TON, DROP DOOR

CABOOSE CARS

Eight Wheel, Cupola Type

OTHER EQUIPMENT

Jordan Spreader
Locomotive Cranes
Overhead Cranes
Railroad Track Scales

STANDARD GAUGE DIESEL-ELECTRIC ROAD SWITCHING LOCOMOTIVE

300 H.P., 70-Ton, Type 0-4-4-0
NEW AND RELAYING RAIL

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8,000 Gallon
10,000 Gallon

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Cleveland No. 3 Double Angle Shear, capacity 6x6 x ¾ angles. Good condition.

ST. JOSEPH STRUCTURAL STEEL CO.
Box 68, Station A, St. Joseph, Mo.

CRANE 125 Ton Alliance, Four Girder Double Trolley Ladle

Span: 54' 5½"
Capacity: main hoist 250,000 pounds
auxiliary hoist 80,000 pounds
Speeds: main hoist 13 F.P.M.
auxiliary hoist 20 F.P.M.
main trolley 75 F. P. M.
auxiliary trolley 125 F. P. M.
bridge 200 F. P. M.
Equipped with G. E. motors and E. C. & M. controllers.

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10 to 12 ft. lengths
ALL METALS
Also Screw Machine Products to Order
EASTERN
Machine Screw Corp.
New Haven, Conn.
Makers of H & G Die Heads

FOR CLASSIFIED RATES
And Further information write
STEEL, Penton Bldg., Cleveland 13, O.

CLASSIFIED

Help Wanted

SALES EXECUTIVE

Manufacturer of steel joists, deck and culvert pipe; steel fabricator of structural, reinforcing and miscellaneous iron; warehousing of related steel specialties. Operation 9 southwestern states; present volume 3000 tons monthly. Position requires promotion of products to architects and engineers, and selling to contractors and owners. Prefer man 35 to 45 years. Excellent opportunity for experienced producer. Write Box 700, STEEL, Penton Bldg., Cleveland 13, Ohio.

PRODUCTION MANAGER

Steel fabricator of structural, reinforcing and miscellaneous iron for the construction industry. At present processing 3000 tons per month. Need energetic man with rich experience background. Splendid opportunity for future development. Position now open due to retirement and unexpected serious illness. Age range 35 to 45 years. Location southwest. Write Box 701, STEEL, Penton Bldg., Cleveland 13, Ohio.

Representatives Wanted

MANUFACTURERS AGENT
COILED WIRE SPRINGS ACCOUNT

Representatives wanted to handle coiled wire spring account on commission and exclusive territory basis. Must be active. Reply stating accounts now handled. Write Box 697, STEEL, Penton Bldg., Cleveland 13, Ohio.

Accounts Wanted

MANUFACTURERS' REPRESENTATIVE with office located in Detroit, Michigan, desires additional lines. Now handling cold-headed items, springs; selling all automotive concerns and diversified industries. Desires well rated washer, stamping, or waste cloth line. Write Box 684, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

EXECUTIVE EXPERIENCED AS PLANT MANAGER with cost and production experience. Sound industrial background in administrative and management functions. 25 years' experience. B.S. Degrees M.I.T. Write Box 693, STEEL, Penton Bldg., Cleveland 13, Ohio.

STRUCTURAL SHOP SUPERINTENDENT, Age 39, thoroughly familiar with all phases of structural and miscellaneous iron work in medium size shop. Capable Administrator. South preferred. Write Box 695, STEEL, Penton Bldg., Cleveland 13, Ohio.

SHOP SUPERINTENDENT

Structural steel, plate, and miscellaneous steel work, welded or riveted construction. 30 years' experience. Will relocate. Can produce tonnage. Write Box 702, STEEL, Penton Bldg., Cleveland 13, Ohio.

WANTED
TUBE MILL SUPERVISOR

A Canadian Specialty Steel Company requires a supervisor for new division producing Stainless Steel Welded Tubing. Applicant must be familiar with forming, welding and drawing of stainless steel tubes. Ability to train operators and handle production problems is essential.

Full particulars re salary and working conditions will be supplied to qualified applicants.

ATLAS STEELS LIMITED
Welland, Canada

PACIFIC COAST
REPRESENTATIVES

We have transferred our office to California and are interested in representing reliable manufacturers of CHEMICALS—METALS—INDUSTRIAL PRODUCTS.

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(formerly of 500—5th Ave., N. Y. City)
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transformers
built to your specifications

Take advantage of our more than 40 years' experience in manufacturing and re-building industrial transformers. Complete satisfaction guaranteed.

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"TRANSFORMER HEADQUARTERS"
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THE ELECTRIC SERVICE CO., INC.
5315 Hetzel St., Cincinnati 27, Ohio

Manual Lincolnweld cuts welding time 50%

FASTER welding speeds now possible with "Manual Lincolnweld" can lower welding costs substantially on a wide variety of work. On these truck bodies, for example, higher welding speeds cut welding time in half. Welds are of higher quality. Less time is needed for weld cleaning.

To simplify operations, the work is held in a positioner permitting most welds to be made in downhand position at currents of 400 amps. The material is mostly ½" plate and 5/16" channel.

The high current density of "Manual Lincolnweld" (up to 600 amps on a 5/64" wire) is 3 to 4 times higher than that used on any arc welding process today. This results in deeper penetration, permits 100% butt welds in ¼" plate in one pass from each side without need for joint preparation, saving manhours and lowering shop costs.

Fig. 1. Truck body *in fabrication on positioner permits operator to make welds on bottom of truck as well as on inside.*

Fig. 2. Manual Lincolnwelding *bottom sections to end at 400 amps. Continuous electrode is fed through welding gun which also supplies granular flux to hide arc rays. Photos courtesy Easton Car and Construction Company, Easton, Pa.*

GET THE FACTS—Latest procedures for cutting costs with "Manual Lincolnweld" are in Bulletin 1303. Write on your letterhead to Dept. 1603.

THE LINCOLN ELECTRIC COMPANY
Cleveland 17, Ohio

THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

125 tons, two-span continuous rolled beam bridge, Wilton-Redding, Conn.; Mariani Construction Co., Inc., New Haven, low.

120 tons, rolled beam bridge, Union, Conn.; M. A. Gammino Construction Co., Providence, R. I., low.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1000 tons, estimated, Chesterfield plant, National Aniline Division, Allied Chemical & Dye Corp., near Hopewell, Va., to Richmond Steel Co., Richmond, Va., and Hall-Hodges Co., Norfolk, Va.; Daniel Construction of Virginia, Hopewell, Va., general contractor; small volume of overall structural requirements placed with Richmond Structural Steel Co., Richmond, Va.

750 tons, Washington state Chehalis river bridge, to Bethlehem Pacific Coast Steel Corp., Seattle; MacRae Bros., Seattle, general contractors.

685 tons, housing project, PHA-31-1, Somerville, Mass., to Joseph T. Ryerson & Son, Inc., Cambridge, Mass.; Jefferson Construction Co., Cambridge, general contractor.

235 tons, municipal garage, Somerville, Mass., to Northern Steel, Inc., Boston; S. & A. Allen Construction Co., Inc., Boston, general contractor.

230 tons, high school, Norfolk, Va., to Hall-Hodges Co., Norfolk; Virginia Engineering Co. Inc., Newport News, Va., general contractor.

190 tons, state highway, Bourne-Sandwich-Barnstable, Mass., to Plantations Steel Co., Providence, R. I.; Campanella & Cardi Construction Co., Hillsgrove, R. I., general contractor.

100 tons, bleachery superstructure, Oxford Paper Co., Rumford, Me., to Bancroft & Martin Rolling Mills Co., South Portland, Me.; F. W. Cunningham & Sons, Portland, general contractor.

100 tons, dormitory, Trinity College, Hartford, Conn., to Scherer Steel Co., Hartford; Industrial Construction Co., Hartford, general contractor.

REINFORCING BARS PENDING

15,000 tons, estimated, bars and piling, substructure, Straits of Mackinac bridge, Michigan; Merritt-Chapman & Scott Corp., New York, general contract; purchase of steel awaits sale of bonds, Mackinac Bridge Authority.

550 tons, bridges, Fulton county, Ohio; bids Apr. 8, Ohio Turnpike Commission, Columbus, contracts C-56 and C57.

500 tons or more, Oregon state highway bridges and crossings in Douglas and Clatsop counties; bids to Highway Commission, Portland, Apr. 8 and 9 respectively.

450 tons, bridges, Fulton county, Ohio; bids Apr. 8, Ohio Turnpike Commission, Columbus, contracts C-56 and C-57.

450 tons, Beckley Interchange, West Virginia turnpike; bids Apr. 14, Charleston, W. Va.

167 tons, Washington state Skagit river swing bridge; bids to Olympia, Apr. 14.

Unstated, proposed 550-foot Yakima river, Washington, county bridge; plans in preparation by Engineers Hadley & Hadley, Seattle.

PIPE . . .

STEEL PIPE PENDING

Unstated, system expansion, Alderwood Manor, Wash.; Superior Construction Co., Seattle, low $42,977.

Unstated, 25,000 feet or more, two schedules; bids to Federal Supply Service, Seattle, Apr. 6 and Apr. 9 respectively.

PLATES . . .

PLATES PENDING

9000 tons, oil refinery, Ferndale, Washington; bids in to Bechtol Corp., San Francisco, general contractors.

Unstated, first phase reactor testing station, Arco, Idaho; general contract to Utah Construction Co., Salt Lake City, Utah, by Atomic Energy Commission, $4,583,028.

Unstated, 1000 pieces steel floor plates; bids in at Seattle Mar. 31.

Unstated, 64 stainless steel tubs, material government furnished; bids to Atomic Energy Commission, Richland, Wash., Mar. 30.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Army Transportation Corps, six diesel electric engines, standard gage, for export, to Baldwin-Lima-Hamilton Corp., Eddystone, Pa.

Help for Exporters

Have you had damage trouble with your export shipments? The National Wooden Box Association, Washington, is offering a new bit of help to avoid such losses with a booklet, "Export Packing: A Guide to Proper Application of Nailed Wooden Containers for Overseas Shipments."

Included in the booklet is information on the size and type of box required for various types of loads, nailing, strapping, interior blocking, bracing, packing and marking procedures. Nothing new, but conveniently gathered into one place. Your packaging engineer can obtain a copy through your container supplier or by writing to National Wooden Box Association, Barr Building, Washington 6.

Schuman Plan Hits a Snag

Indicative of the rough road ahead for the Schuman plan is the current tax trouble between France and West Germany. The Schuman plan calls for equal steel selling prices among members—but the sales tax varies widely between these two countries, 4 per cent in Germany, 19 per cent in France.

Presently the tax is being paid at the border of the using country rather than in the producing country. A proposal before the Montanunion would change that; make the taxes due in the producing country and not in the using country. To meet the German producer's price under the latter arrangement, the French would have to absorb the 15 per cent difference in domestic taxes. Germans insist the present plan of taxing steel sales at the border of the using country violates the Schuman plan theory of no more tariff walls.

The matter is being studied by the High Authority of the Schuman plan, but no quick answer is expected.

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The manufacture of multi-product lines has always created problems for metal fabricators. While diverse metal sizes, shapes and perforations enhance product value and customer acceptance — they also add to manufacturing costs. In order to keep customers happy and keep production costs down, put Hendrick's specialized perforated metal facilities to work.

Your answer to fabricating problems

Hendrick supplies steel sheets tailor-made to your specific job requirements — whether you require perforating, shaping, forming, welding, brazing or riveting, whatever your particular needs be Hendrick has the answer. For more complete information and specifications write Hendrick.

Hendrick
MANUFACTURING COMPANY

30 DUNDAFF ST., CARBONDALE, PA. • *Sales Offices in Principal Cities*
Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids

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1 man ..handles **Sheet Steel** *Faster, Easier* **with a**

C-F LIFTER

C-F Lifters, under one man operation, pick up, carry and unload more sheet steel tonnage per hour than any other method — and at lower cost per ton. Wide carrying angles hold sheets securely — won't damage high grade sheets; tong action insures safe carrying; fast opening and closing adjustments of Lifter jaws permit shifting from one size pack to another in seconds. C-F Lifters are made in standard or semi-special models to handle from 2 to 60 tons.

Write for Bulletin SL-28 for specific examples of C-F Lifter operation and economy.

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STANDARD

Faster assembly . . . no more failures of fasteners. GREER STOP NUTS hold firm against jolts, shocks, shimmy, wobbles . . . any vibration, any kind.

Bolt threads are gripped tightly . . . these famous nuts *never* work loose. Yet an ordinary hand wrench gives instant release. The tough, built-in GREERCOID collar does it . . . and seals against fluid leakage, too!

Study *your* fastener problem. Over 3000 types and sizes. Consult GREER. Proved on thousands of products. Meets gov't and military specifications.

Write

GREER STOP NUT CO.

2620 Flournoy, Chicago 12, Ill.

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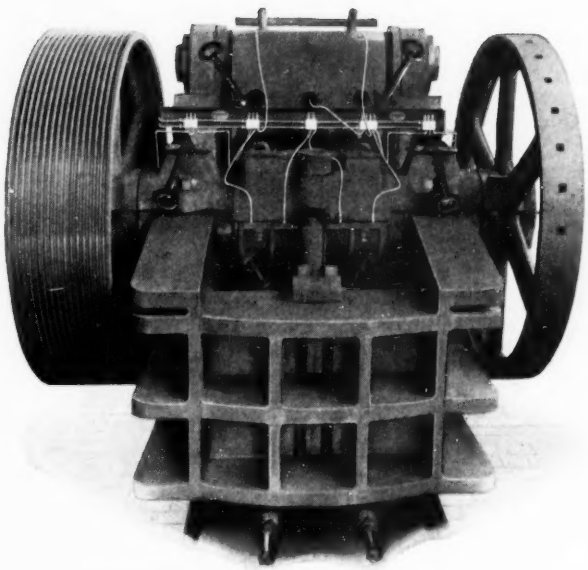
Dust-proof lubrication of Traylor jaw crusher insured by Farval

FARVAL—*Studies in Centralized Lubrication* No. 141



KEYS TO ADEQUATE LUBRICATION — Wherever you see the sign of Farval—the familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine will be properly lubricated. Farval manually operated and automatic systems protect millions of industrial bearings.

Photo of Farvalized jaw crusher by courtesy of Traylor Engineering Company.

YOU can't fool a rock crusher with grease cups and wick feeds. Sooner or later, dirt clogs these devices and gets into the bearings. Abrasive dust cuts. Shutdowns occur. Production stops.

The builder of this 48″ x 60″ jaw crusher didn't take chances with bearing troubles. He chose a foolproof Farval system. Centralized lubrication keeps bearings at top operating efficiency and sealed to repel invasion of dirt and dust.

Farval delivers oil or grease under pressure to a group of bearings from one central station, in exact quantities, as often as desired. The Farval valve has only two moving parts—is simple and sure. No springs, ball checks or pin-hole ports to cause trouble. Farval lubricates while the equipment is working—keeps bearings cool regardless of the kind and quantity of material being crushed. And Farval completely eliminates the need for a hand oiler to clamber over slippery surfaces. Lubrication is safe, sure, cheap—saves labor, production time, bearing expense and lubricants.

With industry moving at high speed, more and more builders and users of machinery and industrial equipment of all kinds look to Farval for continuous bearing protection—low-cost positive protection that has been a Farval trade-mark for over 26 years.

There's a specific Farval system suitable for almost any type and size machine. For information and help, consult the Farval engineer who's near you to serve you. Or write for Bulletin 26. You'll be amazed at the savings in labor, lubricant, and increased bearing life Farval can bring. The Farval Corporation, 3270 E. 80th St., Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

Peace of Mind

assured to competent engineers by use of

SHOCK PROOF
Malleable Castings

The Lake City Malleable Co.

Cleveland, Ohio

The necks of these birds have been bent and twisted to show malleability.